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Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

16: **Toronto Again: Same Words, New Tune.** Previewing next month's conventions of three farm equipment associations, FEWA, FEMA and AIMRA. Though energy, inflation, and other concerns remain from the groups' 1973 get-togethers in Toronto, the temper in which these problems are discussed (as with the temper of the times) should be much calmer this year.

26: **Salesmen's Expenses, Productivity, Product Training and the Manufacturer as Product Innovator.** With selling expenses way up for most distributors, indications are that many of them are working a little bit harder than they did to keep profits up too. Reporting on an I&T survey of farm equipment wholesalers and manufacturers reps.

38: **Farmers Talk Tractor Reliability, Maintenance.** As usual, every tractor model rated by farmers in the recent Professional Farmers of America big-tractor survey received a wide variety of positive and negative marks, but the general feeling seems to be that big tractors have sizable problems with reliability and ease of maintenance.

54: **Energy-Conscious Royal Show.** Machines that save on fuel attracted plenty of attention at the big summer machinery show in Britain, where diesel fuel costs around $2.00 a gallon.

64: **New Tractors: A Quickie Roundup.** The latest models from Case, Long, Steiger, Kubota, Versatile, Belarus and Deere.

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what's ahead...

I&T
SINCE 1886

October 7, 1979

AUGUST RETAIL SALES OF FARM EQUIPMENT were up in most categories, according to the flash report of the Farm & Industrial Equipment Institute. Tractor sales were ahead after a decline in July.

	August			January-August		
Equipment	1979	1978	Pct. Change	1979	1978	Pct. Change
Farm Wheel Tractors						
2-Wheel Tractors						
40-100 hp	3,950	3,878	+1.9	45,981	45,526	+1.0
over 100 hp	3,356	2,941	+14.1	43,273	42,268	+2.4
Total 2-Wheel drive	7,306	6,819	+7.1	89,254	87,794	+1.7
4-Wheel drive	719	522	+37.7	6,933	5,348	+29.6
Total Tractors	8,025	7,341	+9.3	96,187	93,142	+3.3
Combines (S-P)	3,150	3,250	-3.1	14,365	14,434	-0.5
Balers*	2,361	2,254	+4.7	14,576	16,847	-13.5
Forage Harvesters**	1,121	1,022	+9.7	5,506	5,085	+8.3
Mower-Conditioners	2,744	2,395	+14.6	20,126	20,046	+0.4

*Bales under 200 lbs. **Shear-bar type.

WORLD CROP PROSPECTS SUGGEST LARGE U.S. EXPORTS, says U. of Illinois ag economist, D. L. Good. Wheat production outside the U.S. is down 12 per cent (down 25 per cent in the U.S.S.R.). Coarse grain production is down 5 per cent outside the U.S. (down 20 per cent in the U.S.S.R.). The U.S., meanwhile, accounts for 14 per cent of the world wheat crop and 30 per cent of the world's coarse grain output. If current USDA estimates hold up, says Good, the U.S. would account for half the world's wheat exports and 70 per cent of coarse grain exports in the 1979-80 crop year. These estimates are for 1979-80 exports of 1.4 billion bu. of wheat, 2.81 billion bu. of feed grains, 825 million bu. of soybeans and 83 million cwt. of rice. The total increase--to 5.1 billion bu.--would be 16 per cent over the current year.

Key problem in meeting export demand, notes Good, is the capacity of the U.S.'s internal transportation system. The port facilities are probably sufficient, he says, but moving 100 million bu. a week would be difficult in view of tight rail car supplies and the threats of strikes and heavy freezes of the Mississippi and Illinois rivers.

FARM EQUIPMENT THEFT: Hearings are expected to begin sometime this fall on S-1214, legislation introduced earlier by Senators Percy (R.-Ill.) and Biden (D.-Del.) concerning theft of motor vehicles. Section 501 of the bill calls for the Attorney General of the U.S. to file a report with Congress 18 months after the law is enacted dealing with theft of off-highway vehicles in agriculture and con-

(Continued on page 67)

RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-June, 1978				Cumulative for Jan.-June, 1979			
	June, 1978		June, 1979		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	264	87	239	65	1,724	38	1,762	475	1,673	27	1,700	358
Arizona	65	63	50	70	419	34	453	323	372	45	417	343
Arkansas	325	95	350	111	2,134	189	2,323	521	2,141	145	2,286	383
California	449	423	459	426	2,168	140	2,308	1,932	2,451	166	2,617	1,997
Colorado	83	53	106	65	502	52	554	398	575	93	668	371
Connecticut	11	27	30	21	101	3	104	153	112	.....	112	149
Delaware	15	8	29	8	100	7	107	42	135	10	145	29
Florida	183	173	249	250	1,092	31	1,123	823	1,117	40	1,157	1,005
Georgia	346	113	336	88	2,510	31	2,541	489	2,377	25	2,402	495
Idaho	98	26	92	18	607	65	672	151	569	83	652	104
Illinois	617	200	543	274	4,525	404	4,929	1,062	4,087	432	4,519	952
Indiana	490	144	416	86	3,003	250	3,253	730	2,566	261	2,827	518
Iowa	480	74	606	68	4,967	235	5,202	292	5,464	342	5,806	257
Kansas	450	39	399	32	1,919	236	2,155	228	2,137	307	2,444	185
Kentucky	534	99	461	120	2,913	58	2,971	559	2,778	55	2,833	453
Louisiana	222	155	268	108	1,437	133	1,570	677	1,424	97	1,521	498
Maine	30	12	23	13	114	.....	114	74	116	1	117	78
Maryland	81	59	82	66	449	14	463	323	485	22	507	284
Massachusetts	11	39	16	40	71	.....	71	236	85	.....	85	182
Michigan	315	138	317	202	1,792	140	1,932	770	1,667	142	1,809	781
Minnesota	441	66	592	96	3,328	271	3,599	326	3,626	521	4,147	421
Mississippi	327	111	326	54	2,065	108	2,173	488	2,055	77	2,132	397
Missouri	550	108	544	105	2,761	137	2,898	594	3,177	146	3,323	520
Montana	131	20	123	16	374	179	553	132	506	260	766	111
Nebraska	360	32	344	32	2,360	135	2,495	147	2,758	179	2,937	139
Nevada	9	12	11	18	49	.....	49	127	78	3	81	110
New Hampshire	20	13	18	14	75	.....	75	85	67	.....	67	68
New Jersey	41	101	37	95	213	5	218	376	196	3	199	386
New Mexico	40	30	40	29	250	13	263	217	264	16	280	157
New York	314	169	332	139	1,482	50	1,532	836	1,441	61	1,502	642
North Carolina	319	117	305	98	2,535	34	2,569	619	2,509	43	2,552	576
North Dakota	286	25	280	27	1,368	444	1,812	154	1,474	722	2,196	133
Ohio	558	261	476	289	3,305	192	3,497	1,113	2,689	207	2,896	989
Oklahoma	452	97	423	104	1,511	105	1,616	469	1,672	184	1,856	386
Oregon	144	60	120	57	704	37	741	290	632	31	663	308
Pennsylvania	281	206	280	152	1,572	19	1,591	1,032	1,358	22	1,380	806
Rhode Island	3	3	1	6	13	.....	13	28	12	.....	12	27
South Carolina	170	87	165	58	1,148	14	1,162	318	1,155	22	1,177	277
South Dakota	232	20	191	18	1,322	125	1,447	113	1,423	192	1,615	114
Tennessee	437	99	383	99	2,762	57	2,819	602	2,504	46	2,550	527
Texas	921	462	1,084	457	4,413	164	4,577	2,423	5,144	250	5,394	2,199
Utah	45	29	57	61	306	8	314	253	343	10	353	244
Vermont	39	8	63	20	185	1	186	34	202	4	206	42
Virginia	233	116	259	64	1,348	9	1,357	559	1,436	6	1,442	420
Washington	164	99	187	102	768	85	853	510	873	106	979	494
West Virginia	69	37	79	23	315	.....	315	198	320	.....	320	129
Wisconsin	435	92	630	89	3,046	78	3,124	439	3,528	126	3,654	442
Wyoming	30	21	33	26	196	9	205	106	237	16	253	133
Alaska	6	4	5	5	13	.....	13	27	8	.....	8	23
Hawaii	5	6	6	8	30	3	33	35	33	.....	33	52
U.S. Government	7	37	24	14	32	3	35	503	49	.....	49	449
Miscellaneous‡	42	244	10	230	61	2	63	741	42	3	45	784
TOTAL	**12,180**	**4,819**	**12,499**	**4,736**	**72,457**	**4,347**	**76,804**	**24,150**	**74,142**	**5,549**	**79,691**	**21,928**

Data released August 24, 1979, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland, Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; Hy-Dynamic; International Harvester; JCB Excavators; K-D Mfg.; Long; Massey-Ferguson; Pettibone; R. M. Wade (Satoh); Steiger; Versatile; White; and Woods & Copeland.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Farmers talk tractor reliability, maintenance

Survey by Professional Farmers of America reveals some major concerns about the reliability of over-100-hp tractors. Respondents also reported critical big tractor maintenance and accessibility problems.

PFA Members Rate Big Tractor Reliability

PFA member/farmers were asked to rate several different aspects of their big tractors on a scale of excellent, good, fair, or poor. This table reflects their opinions (by manufacturer) on mechanical reliability.

This survey was taken in early 1978. And because the John Deere 40 Series tractors had only been on the market for a short time (since late 1977), their representation in this particular survey is quite low. Deere units dominated the earlier PFA survey of big tractors.

By Frank Buckingham

■CERTAIN MECHANICAL troubles are common to all tractor lines. But a recent survey by the Professional Farmers of America (PFA) has found that tractor reliability, accessibility and maintenance are often costly concerns.

The PFA survey was conducted in early 1978 and involved only those farmer/members operating current model tractors with more than 100 horsepower. Responses were compiled on 583 tractors representing 28 different models and 10 manufacturers. There were 431 two-wheel-drive tractors reported and 152 four-wheel-drive tractors.

This was the second PFA big tractor survey. And like the first—conducted in late 1975—owners were simply asked to rate their own tractors without any standard or comparison to other models.

PFA members were not asked, and few farmers responding to the survey volunteered, what repair costs they had faced. A number did indicate that they had had serious tractor breakdowns, often accompanied by long delays in getting the units repaired.

Some of these problems were corrected under warranty. And in some cases dealers rented or loaned replacement tractors while repairs were being made. The owners, however, still bore most of the repair cost.

Let's talk dependability

Specific definitions for such terms as reliability and durability can differ widely. So, when discussing tractor breakdowns and failures here, we'll use the term "dependability." In other words, is the tractor ready to work when the owner is ready to use it?

A few owners said their tractors were very dependable: *They could depend on them to break down every time they needed them.* Other owners, of course, were quite pleased with the dependability of their tractors.

Comments made by the owners of one tractor model—with almost 30 units reported—were typical of those expressed throughout the survey.

Several owners of this model noted, "No breakdowns," and "Very reliable." And others said, "Tractor composed of time-proven components." "Minor problems—nothing serious."

But still other owners of that model weren't so lucky. "Bearing in transmission out in 300 hours." "Transmission locked in gear six times." "Safety switches caused starting problems." "Alternator drive pulley came loose, ruined alternator shaft and belts," and "Split twice for transmission work—poor factory assembly."

Expensive downtime

Tractor dependability becomes extremely important in the spring and fall for most users. Delays during critical planting and harvesting periods can cost farmers hundreds of dollars each day in lost income, plus the expense and inconvenience of getting equipment operable again.

The cost of a breakdown to the tractor owner may easily amount to several times the out-of-pocket expense of restoring the tractor to working condition.

In the PFA followup survey, three owners reported average downtime delays of three and one-half days each. Two owners said it took them two weeks to get tractor repairs made, and another reported that his new tractor was in the shop three of the first five weeks he owned the machine.

Search for scapegoats

If one is to believe the comments of farmers regarding defective and improperly assembled new tractors, there must be a large number of units leaving the factory in deplorable condition. But rightly or wrongly, many farmers and a few dealers tend to blame "poor factory assembly" or "poor workmanship" for as many mechanical problems as possible.

When failures are definitely pinpointed as being due to improper assembly or similar factors, many company people tend to blame disinterested employees who are sim-

Mechanical Reliability	Allis-Chalmers	J I Case	John Deere	Deutz	Ford	International Harvester	Massey-Ferguson	Steiger	Versatile	White
Engine	E-111 G-30 F-1	E-19 G-5	E-5	E-15 G-1	E-9 G-3	E-197 G-42 F-2 P-2	E-23 G-6	E-31 G-5 P-1	E-33 G-4	E-25 G-2 F-1
Transmission, Drive Train	E-72 G-49 F-13 P-8	E-13 G-10 P-1	E-3 G-2	E-9 G-7	E-8 G-3 F-1	E-127 G-99 F-14 P-3	E-8 G-14 F-5 P-2	E-24 G-9 F-4	E-30 G-6 F-1	E-19 G-4 F-4 P-1
Hydraulics	E-57 G-58 F-17 P-9	E-8 G-16	E-4 G-1	G-6 F-8 P-2	E-7 G-4 F-1	E-101 G-111 F-26 P-5	E-4 G-14 F-7 P-4	E-12 G-13 F-7 P-4	E-15 G-14 F-8	E-16 G-10 F-2
General Reliability	E-64 G-55 F-14 P-1	E-14 G-8 P-1	E-5	E-6 G-8 F-2	E-9 G-3	E-124 G-103 F-9 P-3	E-9 G-17 F-2	E-15 G-18 F-2 P-1	E-29 G-8	E-18 G-8 F-2

ply "putting in their time and drawing wages."

People on the assembly line insist, however, that they are merely following orders to get a certain quota of goods out the door every shift. They say it's impossible to devote the proper amount of care and attention to each individual item.

If the blame can't be placed anywhere else, tractor drivers are eventually accused of failing to care for the equipment and for negligent operation.

One or more of these factors may actually prevail. But finding a scapegoat was probably not much consolation for the famer who reported, "Engine oil pump relief valve fell apart at 180 hours—took two weeks to repair, plus new crankshaft and bearings—problem was workmanship not engineering."

Another owner complained, "Poor oil pressure when delivered, took three months to find hole in block, then used old sleeves, pistons and crankshaft in new block."

Perhaps a rebuilt unit is mechanically equivalent to a new component, but psychologically, they are inferior to many customers.

One owner reported, "Injector pump failed at 60 hours and company refused to put on new pump, used a rebuilt one instead and said I can't do anything about it. But I can, my next tractor will be a different color after using this line 21 years."

(More...)

Correction: Deutz Models Were Introduced in 1971, 1972

To the editor:

I have read with interest "How Pro Farmers Evaluate Big Tractors: New Model Update, 1978" and I also read the excerpts of the report in I&T with Frank Buckingham's commentary. The report makes interesting reading, but unfortunately the two Deutz models listed are somewhat misrepresented—inadvertently, I am sure.

The report indicates, and Buckingham clearly states, that the 28 models included were introduced between 1975 and 1978. For the record, the D 10006 and the D 13006 were introduced in the U.S. in 1971 and 1972, respectively. They are now no longer produced. The reader who is unaware of this may therefore draw a direct comparison between the newer models of U.S. competitors and Deutz models of older vintage and cabs which are not up to date. Buckingham's conclusion (I&T Aug. 21, page 20)—"Deutz, which was not represented in the first big tractor survey, had the lowest cab rating"—may be consistent with the report but is definitely misleading the reader.

We at Deutz have the highest regard for the quality and integrity of *Implement & Tractor*. We also believe in the good intentions of the Professional Farmers of America (which conducted the survey).

F. J. Kaplan, marketing
vice-president
Deutz Corp.
Atlanta, Ga.

(Author Buckingham agrees that it should have been pointed out that the Deutz models were included by PFA in its 1978 report because the number of Deutz models had been too few to include in the 1975 report. Since the 1978 report was issued, Deutz has introduced its DX line of high-horsepower tractors, succeeding the 10006 and 13006 models.—The editors.)

Tractor reliability *(continued)*

Problem areas

Transmission and drive train related problems outnumbered all other problems reported in the PFA followup survey. There was a transmission, or drive train failure, malfunction, or operational problem reported for every three tractors in the survey.

There was also a hitch or hydraulic problem reported for one in every four tractors, and one in 10 had electrical or control system complaints. Numerous hydraulic pump and seal failures were reported and several hitches were said to be too weak for the power of the tractor. Hitch weaknesses included both physical hitch components and the lifting capacity of the hydraulic system.

Premature engine failures, faulty or maladjusted injector pumps, leaking fuel lines and fittings, and other engine and fuel system problems were also noted for one in 10 tractors.

Cab air conditioning and heating systems were singled out for numerous complaints. One model—with 16 tractors reported—had 10 complaints concerning the cab air conditioning and/or heating system.

The perennial problem of oil leaks was noted for one tractor in 28 in the survey. And this did not include those mentions of specific hydraulic or engine oil leaks that were categorized as either hydraulic or engine problems. Some owners indicated that seals had leaked since the tractor was new, and leaky seals of one sort or another had reportedly caused numerous component failures.

On the positive side, favorable comments were offered for one tractor in three regarding general dependability (reliability), or the reliability of specific components such as the engine, hydraulic system, transmission and drive train. Different owners of one model said, "Built too good to break down," and "First tractor that had the bugs out when we bought it."

Owner ratings were reported as excellent, good, fair and poor, and each was assigned values of 4, 3, 2, and 1, respectively. The totals were converted to a percentage of the possible score had all ratings been excellent.

Reliability ratings by manufacturer ranged from 78.9 to 96.2, a spread of 17.3 points, compared with a spread of only 4.5 points between tractor lines in the first PFA tractor survey. The average reliability rating for all tractors in the follow-up survey was 86.7, down slightly from the 87.2 average in the earlier survey.

Maintenance, accessibility

The accessibility rating for repairs and maintenance of a particular tractor may depend on who does the rating, or what tractor model is used for comparison.

Pros and cons were found for the same feature on many models. For example, one owner commented, "Good fueling—no spills on tractor," but another owner of that model griped, "Fuel tank hard to

Farm equipment manufacturers have reliability troubles, too

Farmers aren't the only ones plagued by equipment and/or component reliability problems. A survey taken by the National Fluid Power Assn. (NFPA) last winter found that some farm equipment manufacturers have similar problems with their hydraulic component suppliers.

Hydraulic component users, makers of both self-propelled and non-self-propelled equipment, were asked to evaluate and rate questions about product features. They were also asked to compare the fluid power industry's performance and operation with that of non-hydraulic equipment manufacturers.

Comments made by surveyed manufacturers focused on component reliability, technical assistance, follow-up assistance, product delivery, component quality, and adaptability of components to product systems.

Products covered were: pumps, valves, cylinders, and lines, hoses and fittings.

One manufacturer said, "Poor ratings are true for all hydraulic component suppliers. Someone needs to shake that industry up and bring them into the 20th Century."

Another noted, "There is a definite need for more reliability in the farm machinery industry."

"Service warranties seem like a sideline part of the business for some vendors," wrote another manufacturer. "Parts support is not covered early enough to insure prompt repair of units when a product reaches the field."

When comparing hydraulic cylinder suppliers with non-hydraulic suppliers for product delivery, almost half of the non-self-propelled equipment manufacturers who responded rated them worse than the non-hydraulic suppliers. Valve suppliers faired only slightly better.

Manufacturers of lines, hoses, fittings and pumps, however, were given generally good ratings for product delivery.

One manufacturer wrote, "Hydraulic cylinders are of excellent quality if purchased from reputable sources. However, some sources have very low quality. Lead time is several months ahead of production scheduling."

Not all companies, of course, were critical of their hydraulic component suppliers. Some were even complimentary. But despite their opinions, their answers indicate that farmers aren't the only ones with equipment supplier problems.

get full."

Engineers report that, on some tractors, access to air filters has been deliberately made more difficult because a few owners were found to be over-servicing dry-type air cleaners and literally beating them to death, resulting in filter damage, dust leaks and subsequent premature engine failures.

On the other hand, there has been little justification offered (and even less accepted by farmers) for the unsightly mess created on the sides of many tractors each time oil is added or an engine or hydraulic filter is removed.

Equally confusing and disturbing to some owners is the placement of the engine oil dipstick and filler plug on opposite sides of the tractor, requiring several additional, and seemingly unnecessary, time-wasting steps to check and add oil.

Swing-out batteries were praised by some tractor owners for their ease of inspection and service. However, an engineer defended one model (criticized for extremely difficult battery access) by stating that service-free batteries were provided. That's fine, but such designs force replacement with the same type of battery, or assure frequent replacement of less costly non-serviced conventional batteries.

Cab filter location also remains a point of controversy among some owners. Removing the filter from inside the cab makes it easy to get at and service quickly, but it also means a lot of dirt knocked off the filter and the housing each time it's removed. That means extra cab cleaning.

There was also common sentiment that grease fittings on most four-wheel drives could, and should, be made easier to reach. Location of some fittings requires getting under the tractor daily, which is a distasteful task. Some filters were also said to be very difficult to reach, remove and replace.

The sentiment was also expressed that tractors have become over-sophisticated. One owner, who expressed this feeling more strongly than most, remarked, "Good basic design but too much little-used Mickey Mouse junk hung on to make it look good in sales brochure—keep them simple, why do you think plain, clumsy imports sell as fast as they are produced?"

Overall maintenance ratings (by tractor line) ranged from a high of 92.9 to a low of 78.6. The industry average was 85.4. That's the same industry average for all tractors as in the original PFA survey. The high and low ratings in that first survey were 92.3 and 80.

The overall user rating for ease of maintenance for all four-wheel-drive tractors was 83.1, compared with 86.2 for two-wheel drives. While many aspects of four-wheel-drive tractors are often described as simpler and less sophisticated than two-wheel drives, ease of maintenance apparently has not yet reached that level for the industry as a whole. ☐

ONE MANhandling

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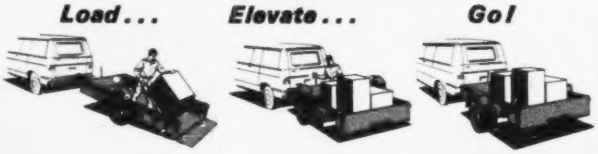
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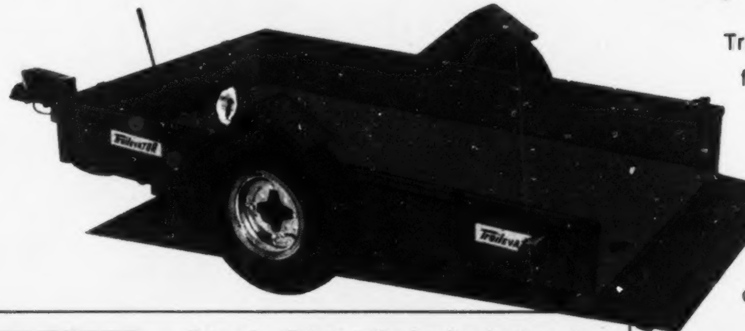
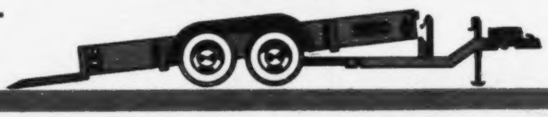


Trailevator lowers to ground level for fast, 'roll aboard' loading, then lifts its own load to hauling position in seconds. Lowers and lifts without uncoupling from towing vehicle. Saves time, saves money. Four models, two capacities: 3,000 lbs. and 2,000 lbs. Bed sizes up to 5'-10" x 10'.

TILTSTER, the low bed trailer that tilts...

Drop-axle, tilt-type trailer handles loads up to 5,000 lbs. Simple one-man operation. Easy access, tailgate ramp for ground level or low platform loading. Single and tandem wheel models. Bed sizes to 5'-10" x 12'.



MagLine

P.O. Box 3910, Pinconning, Michigan 48650
Tel: (517) 879-2411

Circle (33) on Reply Card

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-June, 1978 and 1979 (1)

(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled Power Units		Windrowers Self-Propelled Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979
Alabama	94	91	20	23	221	92	1	.....	1	.....	98	137	20	20
Arizona	29	16	3	.....	17	14	36	30	39	33	6	4	4	6
Arkansas	205	176	1	1	322	169	1	2	1	1	39	39	6	8
California	81	79	13	16	125	68	182	133	198	150	3	9	25	29
Colorado	63	101	15	22	162	109	112	117	115	124	24	47	30	24
Connecticut	.....	.....	.....	.....	29	17	.....	.....	.....	.....	1	2	6	10
Delaware	8	9	3	6	20	5	3	.....	3	.....	2	7	5	3
Florida	38	25	19	19	53	40	.....	1	.....	2	22	41	11	5
Georgia	204	188	124	102	205	95	3	1	3	1	223	323	41	32
Idaho	67	78	3	3	173	122	118	135	121	136	11	24	22	13
Illinois	831	891	716	665	228	152	14	8	14	8	402	448	98	124
Indiana	516	552	469	441	248	174	3	5	3	5	305	412	63	81
Iowa	602	853	548	537	254	172	142	136	142	138	908	1,462	258	255
Kansas	656	779	57	62	248	246	212	233	219	238	153	228	63	85
Kentucky	106	157	88	77	411	202	3	2	3	2	187	226	60	46
Louisiana	101	112	1	.....	93	56	.....	.....	.....	.....	10	12	8	4
Maine	1	1	.....	.....	20	21	.....	.....	.....	.....	.....	1	12	18
Maryland	29	28	30	17	77	50	6	8	7	7	27	29	24	24
Massachusetts	.....	.....	.....	.....	21	20	1	.....	1	.....	3	1	3	6
Michigan	145	150	118	94	250	161	37	34	34	37	151	170	85	158
Minnesota	473	512	272	330	559	358	379	307	389	315	345	649	299	322
Mississippi	137	157	3	3	127	78	.....	.....	.....	.....	40	35	17	17
Missouri	282	319	124	136	480	319	54	58	56	57	266	452	45	73
Montana	95	84	.....	2	128	165	214	161	219	162	30	52	8	11
Nebraska	372	383	227	188	117	112	269	300	275	300	234	424	102	105
Nevada	1	.....	.....	.....	22	15	33	31	36	34	1	1	2	2
New Hampshire	.....	.....	.....	.....	14	12	1	.....	1	.....	.....	2	6	7
New Jersey	15	12	8	5	34	32	1	.....	1	.....	7	11	8	5
New Mexico	8	8	5	.....	78	62	57	48	56	48	7	15	3	2
New York	39	30	49	41	259	212	25	33	27	33	113	74	186	202
North Carolina	77	141	71	74	316	135	2	3	2	3	117	159	30	26
North Dakota	267	358	5	7	38	23	354	316	361	323	60	127	25	20
Ohio	375	468	305	321	435	270	6	7	6	7	308	362	78	90
Oklahoma	269	318	2	2	431	451	98	104	100	108	65	105	17	23
Oregon	91	55	1	.....	172	145	160	109	171	109	11	25	42	34
Pennsylvania	41	68	56	50	480	371	42	40	42	41	184	222	148	184
Rhode Island	.....	.....	.....	.....	2	2	.....	.....	.....	.....	.....	1	.....	.....
South Carolina	73	90	27	33	118	53	.....	.....	.....	.....	52	73	14	12
South Dakota	181	145	66	67	90	43	387	396	402	419	167	260	83	78
Tennessee	106	157	35	34	534	317	2	.....	2	.....	122	174	65	62
Texas	315	367	47	64	679	612	60	59	65	66	102	156	18	33
Utah	12	6	.....	.....	129	95	64	59	64	59	25	55	29	19
Vermont	.....	.....	1	.....	42	38	.....	.....	.....	.....	1	2	28	38
Virginia	49	63	36	50	329	235	5	4	5	4	83	104	65	49
Washington	81	128	3	10	160	101	105	103	104	106	14	15	47	43
West Virginia	2	1	1	2	185	118	.....	.....	....	.....	17	17	15	8
Wisconsin	84	70	113	83	858	706	163	185	163	187	291	432	648	751
Wyoming	13	16	3	2	50	45	58	60	61	61	13	18	4	7
Alaska	.....	.....	.....	.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
U.S. Government	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....
TOTAL	**7,235**	**8,243**	**3,688**	**3,589**	**10,045**	**7,112**	**3,413**	**3,228**	**3,512**	**3,324**	**5,251**	**7,659**	**2,876**	**3,174**

Data released August 24, 1979, Farm & Industrial Equipment Institute.

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(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.

(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types 1978	Mower Conditioners All Types 1979	Manure Spreaders Conveyor-Type 1978	Manure Spreaders Conveyor-Type 1979	
160	137	16	11	Alabama
2	4	5	6	Arizona
340	348	69	80	Arkansas
34	33	37	49	California
54	61	30	53	Colorado
32	38	54	58	Connecticut
16	9	43	47	Delaware
45	39	13	16	Florida
229	153	22	32	Georgia
68	45	85	77	Idaho
490	453	816	716	Illinois
390	416	543	503	Indiana
898	856	1,642	1,785	Iowa
449	566	141	185	Kansas
786	759	241	236	Kentucky
60	60	11	17	Louisiana
44	54	83	89	Maine
82	98	184	145	Maryland
29	38	47	49	Massachusetts
416	359	543	555	Michigan
675	786	1,107	1,286	Minnesota
96	84	18	20	Mississippi
1,054	1,147	278	340	Missouri
62	45	43	35	Montana
292	360	315	413	Nebraska
1	4	2	2	Nevada
33	19	38	37	New Hampshire
45	37	40	39	New Jersey
13	8	2	3	New Mexico
416	504	1,061	941	New York
287	246	131	110	North Carolina
61	73	120	71	North Dakota
746	654	720	722	Ohio
463	574	19	24	Oklahoma
154	110	61	74	Oregon
591	598	964	926	Pennsylvania
5	3	2	1	Rhode Island
115	89	21	24	South Carolina
75	88	190	239	South Dakota
595	606	117	135	Tennessee
728	833	81	91	Texas
80	78	102	66	Utah
85	96	184	180	Vermont
411	474	175	159	Virginia
105	92	71	98	Washington
117	125	66	68	West Virginia
1,454	1,486	1,818	2,047	Wisconsin
110	16	39	37	Wyoming
.....	.....	.....	.....	Alaska
.....	1	.....	1	Hawaii
.....	.....	.....	.....	U.S. Government
.....	.....	1	.....	Miscellaneous
13,493	**13,762**	**12,411**	**12,898**	**TOTAL**

NOW! Any Size Clamp From a Kit

MAC
100% stainless for hose clamps, plastic pipe, irrigation pipe, duct & pipe insulation — strapping and hangers.
MakAclamp
Stock # 4001 4002
Stock #4000 makes:
3 clamps up to 12" diameter
2 clamps up to 17½" diameter
1 clamp up to 33¾" diameter

MakAclamp®, a versatile multi-functional clamp kit enables you to make the exact size clamp for the **"ODD BALL"** size/requirement, using only a screwdriver and metal snips for easy construction. Sizes range from the tool box kit #4000 (8.5 ft. of band with 3 tightening assemblies) up to the larger shop kits #4001 (100 ft. of band with 25 tightening assemblies), #4002 (50 ft. of band with 10 tightening assemblies) and #4004 (box of 10 tightening assemblies). Band splices are included with each kit to join/extend short band segments. All parts are 100% stainless steel including the slotted hex-head screw for lasting performance.

A must for maintenance depts., heavy equipment, farm, auto repair, workshop, marine applications and off-road RV vehicles

3 EASY STEPS TO MAKE ANY SIZE CLAMPS

1. Cut required length of band from roll with snips, cold chisel, or aviation type shears. 2. Insert slotted fastener end in perforated band at one end and screw housing assembly at the other end. 3. Engage slots with worm-drive take-up and tighten clamp with screwdriver, wrench, or socket.

Slotted fastener engages with band
Band is cut to required length
Screw assembly engages with band
Clamp is closed & tightened in conventional manner

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MAK-A-CLAMP
POWER-SEAL
AERO-SEAL
HI-TORQUE

	Each	Postage/ Handling
☐ **#4000** *(8.5 ft. of band with 3 tightening assemblies)*	$ 3.98	+ 1.00
☐ **#4001** *(100 ft. of band with 25 tightening assemblies)*	31.95	+ 3.00
☐ **#4002** *(50 ft. of band with 10 tightening assemblies)*	14.95	+ 2.00
☐ **#4004** *(Box of 10 tightening assemblies)*	6.59	+ 1.00

Total Cost $ __________

Check or money order including postage and handling charges must be sent with order. Open terms extended only on minimum orders of $50.00 or more to credit approved firms, include bank and references. Shipped F.O.B. Saltsburg, Pa.

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City ________________ State ________ Zip ________

BA2315-1 **Circle (41) on Reply Card**

I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

BILL ENLOW TRACTOR SALES
Tulsa, Oklahoma
(August 11, 1979)

ALLIS-CHALMERS TRACTORS

B, 1948 (Fair)	450
D17, diesel, 1959 (Good)	1650
D17, 1961 (Rough)	1010
D17 diesel, 1962 (Good)	2750
D19, 1960 (Rough)	1300
I400, (Good)	2500
7050, cab, 1975 (Good)	9000

CASE TRACTORS

530 diesel, ldr., 1961 (Good)	3500
770, 1970 (Good)	4000
900 diesel, 1957 (Fair)	1000*
900 LP, 1958 (Fair)	980*
930 diesel, 1962 (Fair)	2900

FERGUSON TRACTORS

20, 1949 (Good)	1075
30, 1951 (Rough)	850
30, 1951 (Good)	1300
30, 1951 (Rough)	800*
30, 1952 (Rough)	500
30, 1952 (Good)	1075*
30, 1952 (Good)	1375

FORD TRACTORS

9N, 1943 (Fair)	800*
9N, 1944 (Fair)	750
9N, 1944 (Good)	1100
9N, 1944 (Good)	950
9N, 1945 (Fair)	700
9N, 1945 (Good)	1475
9N, 1946 (Good)	1275
9N, 1946 (Good)	1300
8N, 1947 (Good)	1400*
8N, 1947 (Good)	1250*
8N, 1948 (Good)	1425
8N, 1948 (Good)	1450
8N, 1949 (Fair)	1025
8N, 1950 (Good)	1800
8N, 1951 (Good)	1550*
8N, 1952 (Fair)	1200
8N, 1952 (Fair)	1150
8N, 1952 (Good)	1350
8N, 1952 (Good)	1700
8N, ldr., 1952 (Good)	1650*
8N, 1952 (Good)	1650
8N, 1952 (Good)	1525
NAA, 1953 (Rough)	1075*
600, 1955 (Good)	1750*
800, ldr., 1955 (Good)	2000
801, 1958 (Good)	2550
801, 1958 (Good)	2325
801, 1959 (Good)	2800
900, 1959 (Fair)	1150*
Mjr., diesel, 1956 (Fair)	1000
2000, 1962 (Good)	1950
2000, 1963 (Good)	2500
2000, 1968 (Good)	3000*
2600, 1979 (New)	6000*
3000 diesel, 1966 (Fair)	2750*
3000 diesel, 1967 (Good)	3450
3000 diesel, 1969 (Good)	3450
4000 diesel, 1968 (Good)	4850

INTERNATIONAL HARVESTER TRACTORS

Super A, 1953 (Good)	1500
Cub, mo., 1948 (Good)	1250*
Cub, mo., 1950 (Fair)	1050*
Cub, mo., 1956 (Good)	1300
154 Loboy, 1968 (Good)	1850
154 Loboy, 1969 (Good)	1800
B 275 diesel, (Good)	1700
B 414, (Fair)	1200
444 diesel, 1968 (Good)	2600
454, (Good)	2900
460, 1960 (Good)	1450
460, 1961 (Fair)	1150
504, 1965 (Fair)	1125
664, 1972 (Good)	4250*
806 diesel, 1966 (Good)	4150

JOHN DEERE TRACTORS

MT, 1948 (Good)	450
60, 1955 (Good)	1250
2010, 1961 (Good)	2000
2010 diesel, 1962 (Good)	2400
2010 diesel, 1962 (Good)	2250
2010, 1963 (Fair)	1750*
2020 diesel, 1967 (Good)	4100*

KUBOTA TRACTOR

175 diesel, (Good)	2150*

LONG TRACTORS

445 diesel, (Fair)	2550
384 diesel, (Fair)	2250

MASSEY-HARRIS TRACTOR

44, bld., 1950 (Fair)	300

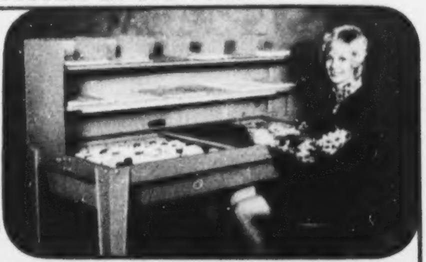
MASSEY-FERGUSON TRACTORS

35, 1958 (Good)	2000
35, 1958 (Good)	2150
35, ldr., 1959 (Good)	2550
35, 1958 (Fair)	1550*
35, ldr., 1960 (Fair)	1925
35, 1961 (Good)	2200
65, 1959 (Good)	1900*
65, 1961 (Good)	2150
65 diesel, 1962 (Good)	2300
65 diesel, 1963 (Good)	2400*
65 diesel, 1963 (Good)	2200*
65, 1963 (Fair)	1750

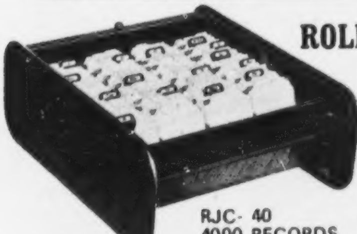
E-Z-WAY THE MOST TRIED, PROVEN AND ACCEPTED INVENTORY CONTROL SYSTEM IN USE TODAY!

METAL TABLE SYSTEMS

9000 RECORDS
$496.50 *
15,000 RECORDS
$700.50 *
18,000 RECORDS
$798.38 *



Three systems—9000 - 15,000 - 18,000 Records. COMPARE THE PRICE . . . low initial cost, easy to set up! COMPARE THE CAPABILITY . . . simple, efficient day-to-day stock control! COMPARE WITH ANY OTHER METHOD . . . any way you look at it you're going to save TIME, MONEY and INCREASE PROFITS.



RJC- 40
4000 RECORDS
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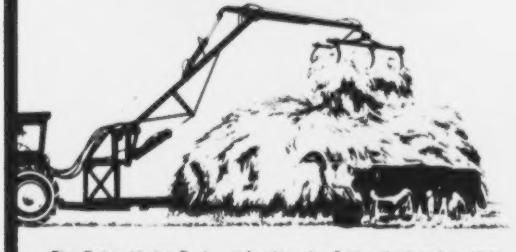
Circle (64) on Reply Card

HOW TO GET A TIGHT GRIP ON LOOSE HAY...



The Baker Hydra-Fork . . . it feeds out a 6-ton stack in less than an hour. Or feeds a tub grinder. Or a baler. And it's as handy in summer for stacking as it is in winter for feeding. Here's why

- ☐ Up to 20 foot reach. 18 foot lift. 170 degree swing radius
- ☐ Choice of tractor hydraulic power or self-contained 10 HP engine
- ☐ Mounts on stack mover, tractor or truck
- ☐ Less wind loss than a flail-type feeder
- ☐ Foreign objects in hay can't hurt the Hydra-Fork

The Baker Hydra-Fork. It can cut your hay handling costs by 50% and more. Call or write immediately for information.

BAKER

BAKER HYDRA-FORK CO.
Neligh, Nebraska 68756 ☐ 402-887-4147

Circle (65) on Reply Card

65 diesel, 1964 (Good)	2150
65, 1964 (Rough)	1575
Super 90 diesel, 1963 (Good)	2775
130 diesel, 1968 (Good)	2100
135, 1965 (Fair)	2600
135, 1966 (Good)	3000
135 diesel, 1966 (Good)	3500
135 diesel, 1969 (Good)	3650
135 diesel, 1970 (Good)	3800*
135 diesel, 1971 (Good)	3750
150, 1967 (Fair)	2675
165 diesel, 1966 (Fair)	2780
165 diesel, 1970 (Good)	4000*
165 diesel, 1971 (Good)	4025
165 diesel, 1974 (Excellent)	5400
175 diesel, 1972 (Good)	4425
230 diesel, 1979 (New)	6100
230 diesel, 1979 (New)	6175
245 diesel, 1979 (New)	6975
245 diesel, 1979 (New)	6800*
245 diesel, 1977 (Good)	5100
202, ldr., 1966 (Fair)	2150*

MINNEAPOLIS-MOLINE TRACTORS

U-302, 1966 (Good)	1850*
602, 1963 (Good)	2000*

NUFIELD TRACTORS

3/45 diesel, (Good)	1300
3/45 diesel, (Good)	1350

OLIVER TRACTORS

550 diesel, 1965 (Good)	1890*
55, ldr., 1955 (Fair)	1200
1855 diesel, 1971 (Good)	5600

WHITE TRACTOR

4-150 diesel, 4-W-D, 1973 (Good)	8200

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

Don't sell too low...

and don't pay too much...

stay up-to-date on used equipment values with I&T SINCE 1886

Check high or low pressure systems...only 50 psi drop at full flow.

HEDLAND FLOW METER TEST KITS

Compact, low-cost testers check hydraulic flow and/or pressure from 0 to 3,000 psi. Detect hydraulic pump leakage under load, verify flow and pressure control settings, monitor overall performance of system, etc. Direct reading—no electrical connections. Four sizes with ¼", ½", ¾" and 1¼" ports...flow scales from 0.05 to 150 GPM. Flow meters available separately for permanent installation or assembling your own test kit.

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20-347

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Heavy Duty Tractor Splitting Stands and Tire Carts

PATENTS APPLIED FOR

- 60 Day satisfaction guarantee
- 1 set of stands fits all tractors (frame or frameless)
- One man installation in less than 5 minutes
- Heavy 6" castors for easy roll

LIKE ADDING A GOOD MAN TO YOUR SHOP

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NOTE

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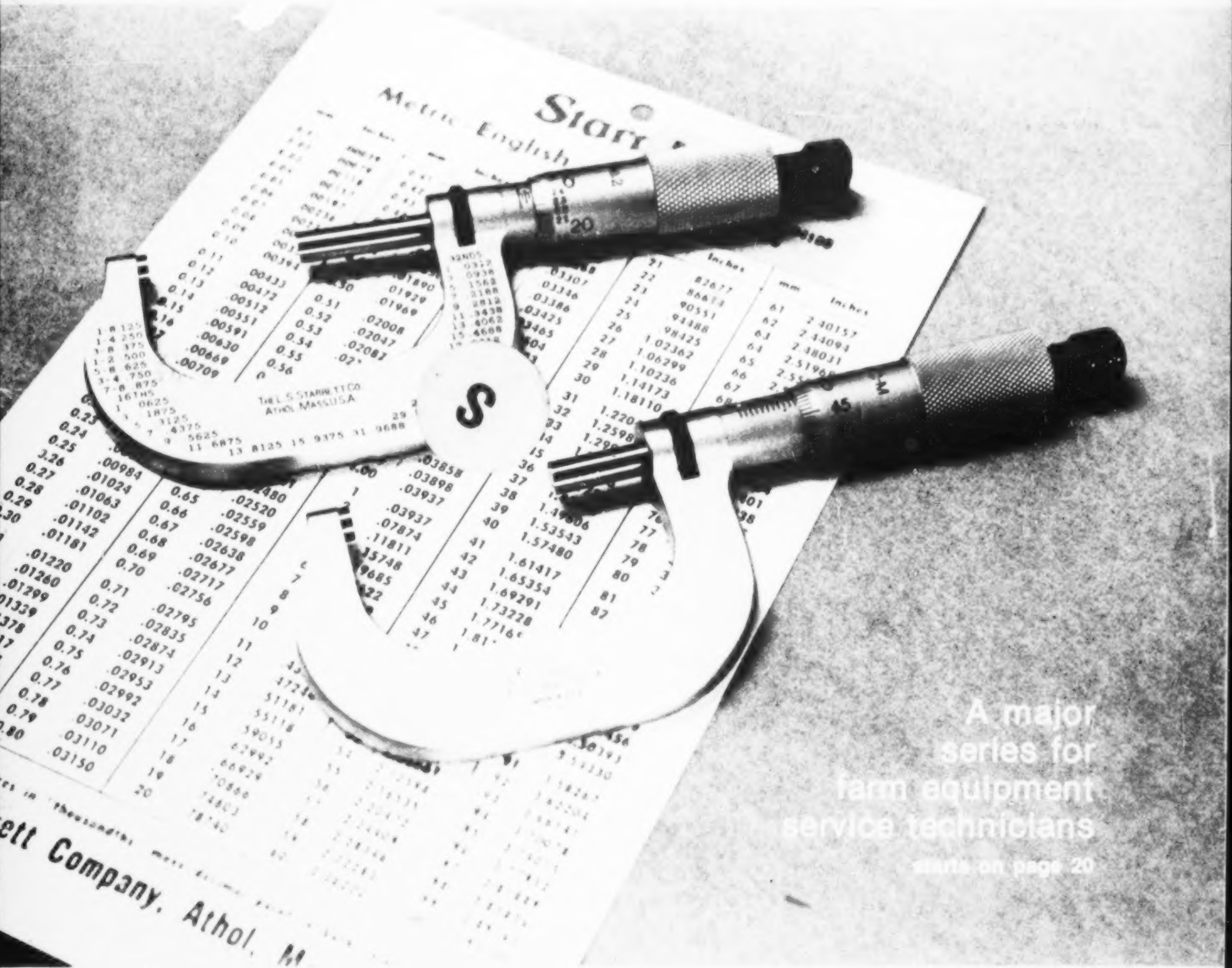
Cover 1, p 4,
p. 12, 14, 34,
p. 26 - 28, 32,
p. 35 - 37.

October 21, 1979
ONE DOLLAR

Serving the Farm and Industrial Equipment Industry Since 1886

Implement&Tractor

DEALING WITH A METRIC WORLD



A major series for farm equipment service technicians starts on page 20

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Engine Air Intake Systems page 8

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October 21, 1979 • Vol. 94 • No. 21

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

8: The Air-Induction System. The modern air-cleaner is one big reason why modern engines are so much better than those of old; but they're not trouble-free. Herein, what the serviceman needs to know about air-cleaner design and function.

14: Ag Mechanization: Shortage of Workers, Questions About Wages. With an existing shortage of persons trained in ag mechanization, the outlook for the future is grimmer yet. Tech school enrollment is down, and farm equipment dealers are facing tough competition for young talent from higher-paying auto dealers.

20: Facing Up to a Metric World. Metrication is on its way, and for the serviceman who cares about his reputation, it's high time to get ready to deal with the new system. First of four articles.

26: Farmers Rate Big-Tractor Fuel Economy. Surveyed by the Professional Farmers of America, many big-tractor owners expressed satisfaction with, or apathy about, their machine's fuel economy. But do they really have any idea of what kind of fuel efficiency they can reasonably expect?

38: Service Salaries, Rates Well Up Among Far West Dealers. Reporting on the Far West Equipment Dealers Assn.'s 1979 Wage and Salary Survey, with a focus on the shop.

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RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-July, 1978				Cumulative for Jan.-July, 1979			
	July 1978		July 1979		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	181	76	154	45	1,904	39	1,943	551	1,825	29	1,854	403
Arizona	51	52	53	60	466	38	504	375	415	55	470	403
Arkansas	249	74	276	46	2,376	196	2,572	595	2,408	154	2,562	429
California	369	253	373	270	2,520	157	2,677	2,185	2,795	195	2,990	2,267
Colorado	78	71	77	50	573	59	632	469	636	109	745	421
Connecticut	7	65	12	18	108	3	111	218	124	.....	124	167
Delaware	19	13	23	7	117	9	126	55	157	11	168	36
Florida	190	129	166	81	1,275	38	1,313	952	1,281	42	1,323	1,086
Georgia	227	59	190	72	2,730	38	2,768	548	2,565	27	2,592	567
Idaho	79	23	78	18	676	75	751	174	635	95	730	122
Illinois	379	178	278	107	4,867	441	5,308	1,240	4,336	461	4,797	1,059
Indiana	285	113	186	80	3,270	268	3,538	843	2,730	283	3,013	598
Iowa	389	42	405	36	5,338	253	5,591	334	5,845	366	6,211	293
Kansas	332	28	377	51	2,207	280	2,487	256	2,436	385	2,821	236
Kentucky	362	100	273	70	3,270	63	3,333	659	3,050	56	3,106	523
Louisiana	169	90	178	66	1,602	137	1,739	767	1,598	101	1,699	564
Maine	31	11	19	16	145	.....	145	85	135	1	136	94
Maryland	52	81	53	41	499	16	515	404	537	23	560	325
Massachusetts	13	45	11	26	84	.....	84	281	96	.....	96	208
Michigan	242	106	154	107	2,020	154	2,174	876	1,811	152	1,963	888
Minnesota	365	37	343	52	3,674	290	3,964	363	3,925	565	4,490	473
Mississippi	229	42	221	32	2,285	117	2,402	530	2,270	83	2,353	429
Missouri	357	89	301	88	3,107	148	3,255	683	3,464	160	3,624	608
Montana	142	8	123	10	474	221	695	140	595	294	889	121
Nebraska	164	41	207	40	2,518	141	2,659	188	2,947	197	3,144	179
Nevada	5	13	9	11	54	.....	54	140	87	3	90	121
New Hampshire	14	11	16	5	89	.....	89	96	82	1	83	73
New Jersey	27	59	15	52	240	5	245	435	209	5	214	438
New Mexico	29	37	40	25	278	14	292	254	301	19	320	182
New York	193	114	193	86	1,672	53	1,725	950	1,627	68	1,695	728
North Carolina	239	79	208	56	2,773	35	2,808	698	2,712	48	2,760	632
North Dakota	221	18	202	17	1,544	489	2,033	172	1,614	784	2,398	150
Ohio	373	166	233	105	3,662	208	3,870	1,279	2,909	220	3,129	1,094
Oklahoma	329	79	480	65	1,813	132	1,945	548	2,073	263	2,336	451
Oregon	113	55	128	46	813	41	854	345	751	40	791	354
Pennsylvania	189	171	173	97	1,759	21	1,780	1,203	1,526	27	1,553	903
Rhode Island	.....	8	3	.....	13	.....	13	36	15	.....	15	27
South Carolina	101	50	120	24	1,246	17	1,263	368	1,273	24	1,297	301
South Dakota	199	13	140	18	1,501	145	1,646	126	1,548	207	1,755	132
Tennessee	301	89	258	79	3,063	57	3,120	691	2,760	48	2,808	606
Texas	779	322	895	343	5,154	202	5,356	2,745	5,980	309	6,289	2,542
Utah	83	34	67	39	387	10	397	287	410	10	420	283
Vermont	31	11	26	7	216	1	217	45	227	5	232	49
Virginia	171	83	176	48	1,519	9	1,528	642	1,611	7	1,618	468
Washington	153	95	142	62	905	101	1,006	605	1,004	117	1,121	556
West Virgina	62	30	56	16	377	.....	377	226	376	.....	376	145
Wisconsin	315	54	298	51	3,353	86	3,439	493	3,817	135	3,952	493
Wyoming	36	18	43	24	228	13	241	124	273	23	296	157
Alaska	1	2	1	2	14	....	14	29	9	....	9	25
Hawaii	21	4	7	9	51	3	54	39	36	4	40	61
U.S. Government	9	60	10	11	41	3	44	563	59	.....	59	460
Miscellaneous‡	.....	319	1	134	61	2	63	1,060	43	3	46	918
TOTAL	**8,955**	**3,820**	**8,471**	**2,921**	**80,931**	**4,828**	**85,759**	**27,970**	**81,948**	**6,214**	**88,162**	**24,849**

Data released September 1, 1979, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; Hy-Dynamics; International Harvester; JCB Excavators; K-D Mfg.; Long; Massey-Ferguson; Pettibone; R. M. Wade (Satoh); Steiger; Versatile; White; and Woods & Copeland.

‡ Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

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Ag mechanization: Shortage of workers, questions about wages

By Frank Buckingham

Survey of Illinois Farm Equipment Association members indicates a strong need—both now and in the future—for individuals trained in ag mechanization. But a U. of Illinois ag engineer has found that dealer personnel practices and low pay scales may be turning potential trainees away from ag mechanization.

■A MATTER of growing concern among some educators and employers of ag engineers is the increasing shortage of individuals trained in ag mechanization.

The number of ag engineers and graduates of the less technical ag mechanization curriculums of many universities, junior colleges, and technical schools isn't keeping pace with demand. And this shortage of individuals trained in ag mechanization was a major topic of discussion among engineers and employers attending the joint meeting of Canadian (CSAE) and American (ASAE) ag engineers last summer in Winnipeg.

A number of prospective employers attending the meeting indicated they were unable to find qualified individuals. And they expressed a need for persons to fill a wide range of positions in industry, as well as public service. They also noted that some jobs have been open for a year or more.

In addressing the shortage of ag mechanization graduates, and the problems in recruiting more students, Roland Espenschied, professor of ag engineering at the U. of Illinois, presented the results of a survey he made involving members of the Illinois Farm Equipment Assn. The group has about 500 dealer/members, and 146 survey responses were obtained.

The figures Espenschied reported, of course, cannot be extrapolated directly to other areas, but the problem of obtaining well-trained new employees is echoed around the country. The table shown on these pages indicates the number of employees needed to fill various dealership positions as indicated by those 146 responding Illinois dealers.

Future Employee Needs, Illinois Farm Equipment Association

	Numbers needed by responding dealers				
Position	**Presently Employed**	**Needed This Year**	**Needed in Two Years**	**Needed in Five Years**	**Proj. all Ill. dealers in 5 Years**
Tractor/power technician	538	170	247	334	1,152
Machinery specialist and setup	394	99	190	209	721
Parts personnel	256	71	110	121	417
Sales	287	81	120	125	431
Bookkeeping	219	47	66	70	241
Management Personnel					
Service manager	127	30	38	40	138
Assembly and handling foreman	33	11	17	19	66
Parts manager	109	20	29	29	100
Sales manager	81	21	23	28	97
Office manager	82	15	21	25	86

Survey involving members of the Illinois Farm Equipment Association indicates the number of employees needed to fill various dealership positions. Responses were obtained from 146 Illinois dealers (out of about 500 dealer/members). The last column is the projected number needed five years from now, statewide, asuuming the remaining dealers will be hiring at the same rate as those responding to the survey.

The responding dealers were (at the time of the survey) employing 188 graduates of technical training programs, which was projected to 648 such graduates for dealers statewide.

Not all the positions listed in the table, of course, can be filled with new technical school graduates. Nor can they be filled satisfactorily by simply hiring the best men away from the competing dealer across the road. Many of the management positions can, however, be filled by promotion from within the ranks of present employees.

More money, better help

Espenschied reported that current technical school enrollment trends are downward, and strong efforts are needed to recruit more students to fill the potential openings.

Espenschied blames much of this problem on present dealer personnel practices and pay scales. He illustrates his contention with reports from former students who first worked for implement dealers and then switched to automobile service departments when they learned that former classmates were earning 50, 75 or even 100 per cent more for doing essentially the same work on cars.

"As diesel cars become more common, farm equipment dealers will lose a lot more good mechanics because they presently have the largest pool of trained diesel service personnel available," Espenschied points out. "And most of them are being paid well below the level of auto mechanics."

One dealer Espenschied talked to was reportedly paying young mechanics $5.45 per hour. And the dealer said, "You should be able to get good help for that. Young men come in and want top money, but they're not worth it."

In many areas, unskilled, shovel-leaning construction workers and truck drivers are paid more than that. So, where's the incentive for a student to pay and take time for technical education?

"If a car dealer can justify mechanic's wages of $8-10 per hour or more for men servicing a farmer's $6,000-8,000 car, then in

(Continued on page 34)

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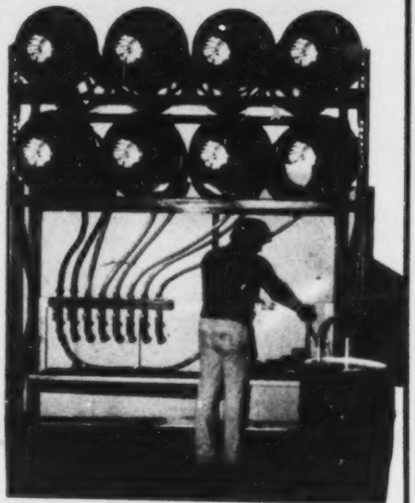

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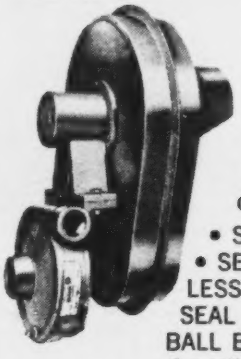

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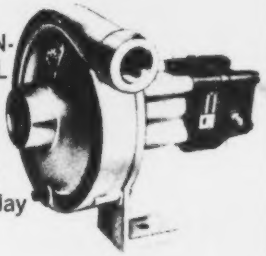

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Worker Shortage

(Continued from page 14)

the same town, a farm equipment dealer with any smarts at all should be able to justify equal pay for men servicing the same owner's tractors and combines that cost 10 times more than the car," Espenschied believes.

"Most of the responsibility for not being able to get and keep good help should be laid right back in the dealer's lap," he points out. "They must become better managers and learn to justify higher wages on the basis of better work performed by better-trained personnel. Until then, they can't expect much sympathy or better help."

Most technical schools, junior colleges, and universities are aggressively recruiting new students. But the farm equipment industry needs to assume a greater responsibility for determining the number and types of personnel needed in the near and foreseeable future.

The industry should actively assist schools in their recruiting programs by contacting potential students and publicizing opportunities within the industry. ☐

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industry in motion

Massey-Ferguson has received the Merit Award for 1979 from the Soil Conservation Society of America. MF was cited for its sponsorship of the film, "We are of the Soil." It describes the history and effects of soil erosion, and ways to control it.

David Ragsdale is a new sales representative for **Shaver Mfg. Co.,** Graettinger, Iowa.

Mark IV Advertising, Peoria, Ill., has been named advertising agency for **Yetter Mfg. Co.,** Colchester, Ill., makers of tillage equipment and other farm equipment.

Mike Lynch has been named marketing and sales manager for **Preco, Inc.,** Los Angeles, Calif., producer of moldboard plows, box scrapers, backhoe buckets, ripper kits and other equipment.

Patricia M. Howe, a partner in the securities firm of L. F. Rothschild, Unterber, Towbin, has been elected to the board of directors of **Lear Siegler, Inc.**

Farmers rate big tractor fuel economy

By Frank Buckingham

Survey by the Professional Farmers of America (PFA) in early 1978 reveals that many big tractor owners are generally satisfied and/or unconcerned about the fuel economy of their tractors. The author wonders, however, whether farmers really know how much fuel consumption to expect from a given tractor.

■IN RECENT months fuel economy and conservation have been forcibly impressed on the minds of the American public. And regardless of the reasons, many farmers have become concerned about the fuel economy of their tractors.

In a Professional Farmers of America (PFA) big tractor survey conducted in early 1978, member/farmers were asked to rate the fuel economy of their tractors. They were also asked to indicate the gallons of fuel burned per hour at full load, and to comment on fuel economy. Responses, as might be expected, were mixed.

Keep in mind that when this PFA survey was made fuel prices were much lower than those that exist today.

Very few farmers are equipped or inclined to accurately measure fuel consumption on a per hour or per acre basis. That means most of their consumption figures should be considered estimates, and some are very questionable estimates.

Fuel consumption figures reported by PFA member/farmers were averaged for each tractor model (see chart). These averages were then compared with average fuel consumption in gallons per hour (gph) obtained during that portion of the Nebraska Tractor Tests involving "75 per cent of pull at maximum power." This Nebraska figure is often used by engineers and others for average fuel consumption under reasonably heavy loads.

All but four of the 28 big tractor models reported in the PFA survey had been tested at Nebraska. Fuel usage by those tractors at "75 per cent of pull at maximum power" had already been determined.

Comparing averages

Average fuel use reported in the PFA survey ranged from 62 to 109 per cent of fuel consumption reported in the Nebraska Tests of the same tractors. The lowest gph and consumption at Nebraska was for the Deutz 10006, and the high in both cases went to the Steiger Panther.

Averages may, however, be somewhat deceiving. About two-thirds of the PFA member/farmers responding to the survey provided some figure for gallons per hour used at full load. But because only limited numbers of some models were reported, an extremely high or low figure for a particular tractor might seriously affect the average for that model.

The average for 43 Allis-Chalmers 7060 tractors, for example, was 8.4 gph or about 95.5 per cent of the 8.8 gph reported in the Nebraska Test. The highest reported fuel use for the 7060, however, was 16 gph or 182 per cent of the Nebraska figure. The lowest reported fuel use was only 3.5 gph—slightly less than 40 per cent of the Nebraska comparison.

The maximum and minimum figures reported by PFA members for the Deutz 10006 tractor, however, were only 4.5 and 3.0 gph respectively. These figures represent only 83.3 and 55.6 per cent of the total consumption reported for that particular model in the Nebraska Tests.

It also appeared that some farmers must be pulling light loads with their big tractors, and thereby holding their gallons used per hour down. For example, the lowest fuel use reported for the Massey-Ferguson 1805 four-wheel-drive tractor was 3.0 gph—compared with 10.6 gph in the Nebraska Tractor Test of that model. The lowest reported figure for the International Harvester 1586 was also 3.0 gph, only 33.7 per cent of the hourly fuel used in the Nebraska Test.

On the other hand, some PFA members estimate extremely high fuel usage by their tractors—almost too high. One engine designer said he had calibrated fuel pumps in the laboratory prior to placing test tractors with farmers who were asked to record fuel consumption. Fuel output was again verified upon return of the tractors. And on several occasions, farmers reported more fuel used than the pumps were physically capable of pumping per hour.

Fuel economy ratings

In spite of the apparent ambiguity between reported fuel use and that used in the Nebraska Tractor Tests, a correlation of sorts was found. Tractor owners were asked to rate the fuel economy of their tractors as excellent, good, fair, or poor. These ratings were then assigned values of 4, 3, 2, and 1 respectively. Those values were then converted to a percentage of the possible score if all ratings had been excellent.

Such composite ratings were calculated by tractor model, manufacturer, and for all tractors reported in the PFA follow-up survey.

The ratings obtained for all tractors were then compared with figures obtained during the original PFA big tractor survey conducted in late 1975. The results of that first survey were presented in a series of I&T articles in 1976.

The new overall rating was found to be 4.1 points higher—78.7 versus

(More...)

Fuel Economy—Farmer Ratings, Nebraska Results

	PFA Members		Nebraska Tractor Tests	
Tractor Make, Model	Farmers rate Fuel economy (1)	Ave. fuel use —heavy load (Gals/hr)	Max. power available (Gals/hr)	75% of pull at max. power (Gals/hr)
Allis-Chalmers				
7000	E-5, G-16, F-3, P-1	5.5	6.8	6.1
7040	E-11, G-24, F-2, P-2	7.2	8.8	7.8
7060	E-12, G-27, F-12, P-1	8.4	10.0	8.8
7080	E-1, G-3 F-2	9.5	11.3	10.3
7580	E-4, G-6, F-1	9.6	12.6	11.2
J I Case (2)				
1570	E-3, G-11, F-2, P-1	9.4	11.6	9.8
2870	E-1, G-4	13.0	16.2	14.1
John Deere (3)				
4440	E-1, G-5	8.3	8.6	7.6
Deutz (4)				
10006	E-6	3.6	7.3	5.4
13006	E-9	5.6	7.3	6.4
Ford				
8700	E-2, G-2	4.1	7.8	6.6
9700	E-2, G-3, F-2	7.0	9.0	7.9
International Harvester				
986	E-3, G-12, F-2, P-1	6.2	7.1	6.4
1086	E-32, G-61, F-12, P-1	6.5	8.5	7.4
1486	E-8, G-29, F-2, P-1	7.5	9.5	8.4
1586	E-13, G-25, F-11, P-1	7.9	10.5	8.9
4386	E-1, G-6	10.3	13.6	11.4
4586	E-3, G-1, F-1	10.3	17.7	15.7
Massey-Ferguson				
1505	E-2, G-3	8.3	12.0	10.3
1805	E-3, G-17, F-2	8.9	12.8	10.6
Steiger				
Cougar 250/251	E-4, G-4	10.9	15.9/13.5(5)	14.1/11.8
Cougar 270	G-6, F-3, P-1	12.9	16.6/16.4(6)	14.6/14.3
Panther 320/325	E-6, G-9	13.4	18.2	15.9
Versatile				
750	E-3, G-1	8.4	NA(7)	NA
800	E-7, G-3	8.6	NA	NA
850	E-13, G-7, F-1, P-1	11.1	NA	NA
White				
2-155	E-2, G-5	7.8	10.4	9.2
4-180	E-11, G-7, F-1	8.8	12.8	10.6

(1) E—Excellent, G—Good, F—Fair, P—Poor

(2) Since the PFA survey was taken in early 1978, the J I Case Company has replaced Models 1570 and 2870 with Models 2590 and 4890, respectively.

(3) Because this survey was taken in early 1978 and because the John Deere 40 Series tractors had only been on the market for a short time (since late 1977), their representation in this particular survey is quite low. Deere units dominated the earlier PFA survey of big tractors.

(4) Deutz Models 10006 and 13006 (introduced in the U.S. in 1971 and 1972 respectively) are no longer produced. They have been replaced by the Deutz DX Series tractors.

(5) Numbers to the left of the slash mark represent the gallons of fuel used per hour by the Steiger Cougar III ST-250 Diesel during designated tests of drawbar performance in the Nebraska Tractor Tests. Numbers to the right of the slash represent gallons of fuel used per hour (during the Nebraska Tests) by the Steiger Cougar III ST-251 Diesel.

(6) Numbers to the left of this slash mark represent gallons of fuel used per hour by the Steiger Cougar III PT-270 Diesel and the Steiger Cougar III PT-270 without PTO during the designated Nebraska Tests. Numbers to the right indicate the average amount of fuel used by the Steiger Cougar III ST-270 Diesel in those same tests.

(7) NA means not available. These Versatile tractors have not been tested in Nebraska.

"Didn't buy my tractor for fuel economy."

74.6. This was one of the few areas in which ratings of various tractor features in the follow-up survey exceeded those from the first survey.

Four tractor lines had higher ratings in the follow-up than they received in the first survey, and five had lower scores the second time. The 10th line in the follow-up, Deutz, was not represented in the first survey, but received a perfect score in the follow-up. Fuel economy ratings for all Deutz 10006 and 13006 tractors were "excellent."

It should be pointed out, however, that the Deutz Model 10006 and 13006 tractors are no longer produced. Since the 1978 PFA survey was taken, Deutz has introduced its DX Series of high-horsepower tractors, succeeding the 10006 and 13006.

J.I. Case has also introduced its 90 Series tractors since this PFA survey was taken. The Model 2870 listed in the survey, for example, has been replaced this year by the Case Model 4890 tractor. And Model 1570 was replaced in 1978 by the Case Model 2590.

At the other end of the scale, tractor lines with the lowest user ratings for fuel economy also had fuel consumption averages closest to the amounts obtained in the Nebraska Tractor Tests.

This relationship, however, between reported fuel use and consumption in the Nebraska Tests did not follow through consistently for all tractor lines, and was not particularly apparent for individual models. Higher user ratings were generally given to tractor models with lower average fuel consumption.

Most PFA members (at the time of the follow-up survey) appeared satisfied with or even totally unconcerned about the fuel economy of their tractors. Favorable and neutral comments on fuel economy outnumbered complaints by more than four to one.

Numerous owners remarked that fuel consumption was quite good for the amount of work done. Some commented, "Uses a lot but does a lot." "Less fuel to plow than smaller tractors," and "Real good on light loads."

Other owners disregarded the entire matter with such remarks as, "Didn't buy it for fuel economy."

"My big tractor uses less fuel to plow than smaller tractors."

Some owners upset

Many owners were concerned, and a few seemed very upset about the amount of fuel used by their big tractors. One griped, "Excessive fuel consumption—it's the tankwagon man's best friend—sometimes only gets four hours of operation on a tankful."

Another owner of the same model, plus a larger one in the same line, complained that the larger tractor burns more fuel than the smaller one when both are pulling the same size plow.

Some owners indicated that fuel consumption varied with the load. One said it fell from 7.5 gph with a heavy load to 2.5 gph on light loads.

Several other users complained, however, that too much fuel was used on light loads. Part of this, of course, might be attributed to use of very big tractors for small jobs. Air conditioner use would also increase fuel consumption.

How much is too much?

The level of maintenance, loads pulled, and the operating habits of the tractor operator may also affect the amount of fuel consumed by a given tractor, just as personal expectations of the owner can affect his satisfaction with the amount used.

The amount of fuel said to be used per hour at full load by a tractor seems to have little bearing on the owner's rating of fuel economy as excellent, good, fair, or poor. As a case in point, for one four-wheel-drive tractor with 235 drawbar hp, fuel use of 9.0 gph was rated "good" with the comment that "it could be better."

Fuel use of 13 gph by the same tractor was rated "fair" and 16 gph was rated "excellent."

Another owner rated 18 gph as "excellent" for his four-wheel-drive tractor, although that's two gph more than that tractor used in the Nebraska Tractor Tests.

The incongruity of reported fuel use and owner ratings of fuel economy may imply two things. First, the owners don't know how much fuel is really being used per hour or per acre, and as long as it seems reasonable they aren't going to complain. Secondly, they don't really know what fuel consumption they should expect from a given tractor.

Are tractor buyers really being informed as to the amount of fuel they can reasonably expect a certain tractor to burn per hour under full load, under partial load?

Farmers, of course, discuss fuel use with neighbors and friends using similar tractors. But seemingly minor differences are often discounted as being due to soil conditions, implement working depth, or some other reason.

How many stop to realize that there's a 20 per cent difference in fuel use between two tractors using eight and 10 gph to do the same work?

Proper interpretation of the results of Nebraska Tractor Tests can provide guidelines to anticipated fuel consumption, as well as power output. Sharing this information with all prospective tractor buyers will better enable them to know when fuel consumption is within reasonable bounds and approximately what rate of fuel use they can expect.

Continued limitation of fuel supplies and higher prices, which appear inevitable, will increase the demands for accurate fuel economy figures for all power equipment. ☐

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-July, 1978 and 1979 (1)

(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled				Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
							Power Units		Total Heads					
	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979
Alabama	12	119	30	32	280	147	1	....	1	....	109	148	30	25
Arizona	35	18	5	....	20	24	40	40	43	43	6	4	5	8
Arkansas	295	208	1	1	414	300	1	2	1	1	43	41	6	12
California	121	108	20	21	151	128	208	156	227	176	3	11	30	31
Colorado	137	172	25	38	263	274	153	175	160	176	26	49	38	36
Connecticut	....	1	....	....	46	44	....	....	....	....	1	2	8	14
Delaware	10	13	4	9	27	11	3	....	3	....	2	8	7	4
Florida	62	42	32	34	77	56	....	1	....	1	25	45	17	8
Georgia	284	241	179	169	263	160	4	1	4	1	256	339	61	49
Idaho	133	135	3	4	293	296	176	221	186	222	11	25	29	19
Illinois	1,196	1,194	957	873	304	278	26	11	26	11	425	463	136	148
Indiana	739	683	632	543	347	291	6	7	5	7	337	426	90	96
Iowa	945	1,105	832	798	350	300	194	188	196	190	983	1,518	379	376
Kansas	982	1,118	86	80	326	345	252	282	259	290	163	245	76	103
Kentucky	172	177	116	85	538	345	3	3	3	4	199	232	78	62
Louisiana	196	169	2	....	109	87	....	....	....	....	11	12	13	8
Maine	1	1	....	....	51	63	....	3	....	3	....	1	18	23
Maryland	43	45	45	32	118	88	8	6	8	6	31	34	26	34
Massachusetts	....	....	....	....	44	30	1	1	1	....	3	1	6	10
Michigan	231	208	174	124	405	271	48	49	48	51	161	181	143	206
Minnesota	725	669	387	437	748	620	558	444	573	454	374	682	419	488
Mississippi	186	199	7	3	160	102	....	....	....	....	42	36	25	29
Missouri	382	461	31	173	625	497	71	65	73	65	294	477	62	90
Montana	182	138	....	2	286	251	352	307	381	317	32	55	24	17
Nebraska	625	562	338	282	184	172	342	359	357	370	255	457	137	148
Nevada	1	....	....	....	32	29	43	48	46	51	1	1	3	2
New Hampshire	....	....	....	....	33	29	1	....	1	....	....	2	9	8
New Jersey	19	17	10	6	55	46	2	....	2	....	10	11	12	6
New Mexico	11	13	6	....	119	89	68	64	66	64	10	17	3	3
New York	47	43	54	50	492	477	40	42	42	42	124	83	272	288
North Carolina	109	177	94	97	429	240	2	3	2	3	127	166	36	31
North Dakota	521	517	7	10	105	59	611	529	643	553	62	141	47	40
Ohio	572	605	429	421	659	473	9	10	8	10	328	384	113	114
Oklahoma	314	372	2	2	595	647	115	125	118	128	68	111	19	28
Oregon	124	88	2	....	258	215	203	149	213	150	11	26	46	41
Pennsylvania	80	111	70	68	766	652	57	56	58	55	195	237	217	248
Rhode Island	....	....	....	....	3	3	....	....	....	....	....	1	....	....
South Carolina	99	115	45	42	133	68	....	....	....	....	54	30	18	16
South Dakota	355	225	106	91	192	106	569	551	603	589	176	274	127	127
Tennessee	137	193	43	40	672	475	2	....	2	....	135	187	87	73
Texas	538	535	123	117	909	994	73	81	80	90	114	179	21	41
Utah	23	17	....	....	207	200	101	87	100	88	25	55	38	28
Vermont	....	....	1	....	77	77	....	....	....	....	1	2	45	54
Virginia	69	80	49	62	469	379	7	5	7	5	91	112	76	58
Washington	182	196	5	25	240	187	122	133	122	138	14	15	62	52
West Virginia	2	2	1	3	298	199	....	....	....	....	18	20	17	12
Wisconsin	121	99	144	111	1,287	1,257	205	259	205	262	315	456	924	1,061
Wyoming	20	23	4	2	133	131	97	97	102	103	14	19	9	10
Alaska	....	....	....	....	2	3	....	....	....	....	....	....	....	....
Hawaii	....	....	....	....	....	....	....	....	....	....	2	....	....	....
U.S. Government	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Miscellaneous (4)	1	....	....	....	....	....	....	....	....	....	....	6	....	....
TOTAL	11,153	11,215	5,231	4,887	14,594	12,215	4,774	4,580	4,975	4,721	5,687	8,073	4,064	4,385

Data released September 1, 1979, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asteris.· beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(September 11, 1979)

ALLIS-CHALMERS TRACTORS

XT190, LP, high profile, 1967, (Fair)	2100
185 diesel, 1975 (Good)	6300
175 diesel, 1970 (Fair)	4000*
D21 diesel, 1967 (Good)	3500*
D17 diesel, 1965 (Good)	3400*

CASE TRACTORS

1370 diesel, cab, 1974 (Good)	6300*
830 diesel, 1965 (Good)	2350*
VAC, 1949 (Fair)	250

DEUTZ TRACTORS

9006 diesel, 1972 (Fair)	3600*
4005 diesel, (Fair)	1125*

DAVID BROWN TRACTORS

880 diesel, 1965 (Fair)	500
880 diesel, 1965 (Rough)	350
880 diesel, 1965 (Fair)	480

MASSEY-FERGUSON TRACTORS

1105 diesel, 1973 (Good)	7700*
1080 diesel, 1972 (Fair)	4300*
230 diesel, 1976 (Good)	3850
180 diesel, 1968 (Good)	3825*
180 diesel, 1967 (Fair)	2300
180 diesel, 1967 (Good)	3800
175 diesel, 1971 (Fair)	3250
175 diesel, 1967 (Good)	3700
165 diesel, 1970 (Fair)	2600*
2135 diesel, 1966 (Fair)	1475
135 diesel, 1973 (Excellent)	3900*
135 diesel, 1967 (Fair)	2550*
35 diesel, 1963 (Good)	2250
35 diesel, 1962 (Good)	2000*
35 diesel, 1961 (Fair)	1225*
35 diesel, 1961 (Good)	2150
35, 1955 (Fair)	1175*
35, 1955 (Fair)	1700
40, ldr., 1970 (Fair)	2750
TO20, 1950 (Fair)	650
TO20, 1950 (Fair)	675

FORD-FERGUSON TRACTORS

9N, 1944 (Good)	975

FORD TRACTORS

8000 diesel, 1969 (Good)	5450*
8000 diesel, cab, duals, 1969 (Fair)	5300*
5550 diesel, ldr., backhoe, 1971 (Good)	7750*
4000 diesel, corn picker, 1963 (Fair)	1600*
4000, Select-O-Speed, 1963 (Fair)	750*
3400 diesel, 1966 (Fair)	2300*
3400 diesel, 1966 (Good)	2850
3400 diesel, ldr., backhoe, 1966 (Excellent)	5500*
3000 diesel, 1967 (Fair)	2950
3000 diesel, 1966 (Good)	3400*
3000, 1966 (Good)	2900*
2000 diesel, 1966 (Good)	2650*
2000, 1963 (Fair)	2200
2000, 1963 (Fair)	1900*
941, corn picker, 1958 (Good)	1700
871, Select-O-Speed, 1958 (Good)	1300*
861 diesel, 1958 (Rough)	500
861 diesel, 1958 (Fair)	1350
860, 1955 (Fair)	1550
850, 1955 (Good)	2100
850, 1955 (Good)	1900*
841, 1959 (Fair)	1175*
841, 1958 (Good)	2050*
740, 1955 (Fair)	975
740, 1955 (Rough)	400
641, 1959 (Good)	1900*
641, 1958 (Good)	2000
640, 1955 (Fair)	1475*
640, 1955 (Good)	1900
621, 1960 (Good)	1950*
Sup. Maj. diesel, 1962 (Fair)	550
Sup. Dexta, 1962 (Fair)	800*
Sup. Dexta, 1962 (Good)	1100*
Dexta, 1959 (Fair)	925
Jub., 1953 (Good)	1550
Jub., 1953 (Fair)	1400
Jub., 1953 (Good)	1700*
8N, 1951 (Good)	1275
8N, 1951 (Good)	1250
8N, 1950 (Good)	1225
8N, 1950 (Good)	1300
8N, 1949 (Fair)	1075*
8N, 1949 (Fair)	1050

INTERNATIONAL HARVESTER TRACTORS

1468 diesel, cab, 1972 (Excellent)	8000*
1256 diesel, 1968 (Fair)	5000*
706 diesel, duals, 1965 (Fair)	2700*
664 diesel, 1972 (Good)	4950*
574 diesel, 1972 (Fair)	3100
574 diesel, 1972 (Fair)	2600*
460 diesel, 1959 (Fair)	750
444 diesel, 1970 (Fair)	1550
444 diesel, 1967 (Good)	1800*
B414 diesel, 1962 (Good)	1400
B414 diesel, ldr., 1962 (Fair)	950
404, 1967 (Good)	1525
404, 1964 (Fair)	1050*
404, 1961 (Fair)	1300*
354, ldr., 1973 (Good)	3300
300, 1955 (Rough)	150
M, duals, 1950 (Good)	725*
Sup. H, corn picker, 1953 (Fair)	300*
H, 1946 (Good)	375*

(More...)

Auger Up Bigger Profits with KOYKER Super Augers

SUPER 105
Big . . . high-capacity industrial type auger for the farm. Has new 10" Super-Rib tube with special design that gives more space for large volume grain moving. Handles up to 6250 bu. per hour. Bottom-end drive enclosed in oil bath for minimum maintenance . . . long life. Super-105 is extendable from 52' to 72'. This bonus reach and height will allow your customers to reach most farm bins.

SUPER 85
Built for hard work, Super-85 has unique Super-Rib auger tube with effective diameter of 8½ inches . . . larger than any 8" auger on the market. Can handle up to 3500 bu. per hour. Powerful lower-end drive completely enclosed in oil. Super-85 available in 8 lengths from 33' to 68'. Heavy trussed-girder undercarriage engineered from high tensile steel tubing. Complete accessories available including Swing-A-Way hopper.

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SUPER-75B
Rugged, powerful 7½" Super-75B moves as much grain as most 8" augers with only half the wear! Special screw turns about half the RPM's of most 6" augers. This means less maintenance . . . longer life. The economical Super-75B is extendable to meet your customers' future needs. Available in 8 lengths from 26' to 61'. Complete accessories: Safety Relief Gate, Swing-A-Way, Tilting or Triangle Hoppers; Cleaning Sections; Choice of Drives; Other Options.

SUPER-60
The inexpensive 6" price-conscious auger designed with same high-quality precision parts found only on larger 7½" augers. Will handle straight grain moving jobs that do not require specialized features. Available in 32', 42' and 47' lengths. PTO, Electric or Gas Drives.

Your sales and profits depend on supplying your customer with the exact auger he needs. Koyker Super Augers are packed with all the high-performance, fast-selling features that can make the Koyker line your top profit line. Write today for information and discounts.

WRITE Dept. K-26-102

KOYKER MANUFACTURING COMPANY
[illegible]

Circle (27) on Reply Card

Auctions *(continued)*

140, cult., 1959 (Good)	1600*
Cub Loboy, mo., 1968 (Good)	1800*
Cub Loboy, mo., 1963 (Good)	2000
Cub Loboy, mo., 1962 (Fair)	1300
Cub, plow, 1948 (Fair)	550

JOHN DEERE TRACTORS

7020 diesel, cab, duals, 1973 (Good)	8000*
4020 diesel, 1965 (Fair)	3000
4010, 1962 (Good)	2950*
2010, 1962 (Fair)	900*
1010, 1967 (Fair)	1150*
310 diesel, ldr., backhoe, 1975 (Excellent)	9100

LEYLAND TRACTORS

384 diesel, 1971 (Fair)	1750
344 diesel, 1971 (Good)	2750

MINNEAPOLIS-MOLINE TRACTORS

670 diesel, 1965 (Fair)	1550*
670 diesel, 1965 (Fair)	1600*
500, backhoe, 1965 (Fair)	1900

OLIVER TRACTOR

1250 diesel, 1966 (Good)	1850*

SATOH TRACTOR

Stallion diesel, (Excellent)	4700

HEFTY TRACTOR

F, (Good)	1900*

VERSATILE TRACTOR

145 diesel, (Fair)	3900

YODER & FREY, INC.
Archbold, Ohio
(September 11, 1979)

ALLIS-CHALMERS TRACTORS

XT190, 1966 (Rough)	3800*
D15, 1961 (Rough)	1650
D15, ldr., (Rough)	920
WD, plow, 1959 (Fair)	975
WC, 1947 (Fair)	450
C, (Rough)	280
G, (Fair)	500

CASE TRACTORS

1170 diesel, 1971 (Good)	8000*
830, 1968 (Good)	2300
800, plow, 1959 (Fair)	1000
830, 1962 (Rough)	600*
530, ldr., 1968 (Good)	3400*
430, ldr., 1963 (Fair)	2500

DAVID BROWN TRACTORS

1200 diesel, 1970 (Fair)	3200*
1200 diesel, (Rough)	1350*
885 diesel, (Good)	3700*

JOHN DEERE TRACTORS

4430 diesel, 1974 (Excellent)	16,100*
4320 diesel, 1971 (Good)	10,800*
4020 diesel, 1968 (Good)	7500*
4020, 1967 (Good)	4450
2510, 1966 (Good)	3625
2010, 1962 (Fair)	2100
2010 diesel, 1961 (Rough)	1550
730 diesel, 1960 (Fair)	2600*
730 diesel, 1959 (Good)	2450
730 diesel, 1959 (Fair)	2200
720 diesel, 1957 (Good)	2000
720 diesel, 1957 (Fair)	1725*
420, 1957 (Good)	1800
320, 1968 (Good)	4800
70 diesel, 1952 (Fair)	1250*
60, 1954 (Good)	1025*
60, 1954 (Fair)	700
60, 1954 (Fair)	650
40, 1954 (Rough)	775
G, 1946 (Fair)	450
A, 1947 (Fair)	510*
B, 1946 (Rough)	375*

DEUTZ TRACTOR

6006, 1972 (Fair)	3700*

FORD TRACTORS

9600 diesel, 1975 (Excellent)	11,900*
9000, 1971 (Good)	8650
5000, 1971 (Good)	5275*
5000, 1971 (Good)	5100*
5000, 1965 (Fair)	3500*
5000,	2200
4000, 1977 (Excellent)	5000*
4000 diesel, (Fair)	2700
4000, 1967 (Fair)	2550*
4000, 1967 (Rough)	1975
4000, 1965 (Good)	2950
4000, 1965 (Fair)	1950*
2600, (New)	5100*
1600, mo., (New)	4250
860, 1958 (Rough)	1650
860, 1957 (Fair)	1500*
741, ldr., 1958 (Good)	2050*
600, 1956 (Fair)	1525*
2000 Dexta, 1965 (Good)	2025
Maj. diesel,	1500
Jub., ldr., 1953 (Good)	2100*
Jub., ldr., 1953 (Fair)	2000*
Jub., 1953 (Fair)	1500*
Jub., 1953 (Fair)	1400
Jub., 1953 (Rough)	950
8N, ldr., 1952 (Good)	1800
8N, 1952 (Fair)	1275*
8N, 1952 (Fair)	1150*
8N, 1952 (Fair)	1000
8N, 1951 (Good)	1375
8N, 1950 (Fair)	1150
8N, 1950 (Fair)	1000*
8N, 1950 (Fair)	925*
8N, 1949 (Fair)	1250
8N, 1949 (Fair)	1100
8N, 1949 (Fair)	1000*
8N, 1948 (Fair)	1025
8N, 1946 (Fair)	900*
9N,	1025
9N, 1945 (Fair)	775*

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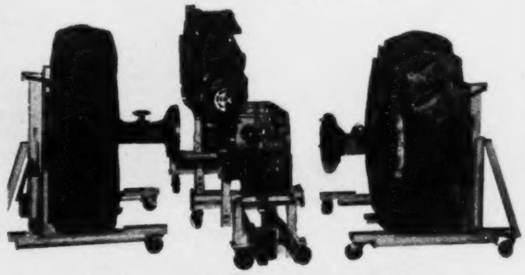
Heavy Duty Tractor Splitting Stands and Tire Carts

PATENTS APPLIED FOR



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- 1 set of stands fits all tractors (frame or frameless)
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Agricultural & Industrial Manufacturers Representatives Association
P.O. Box 1311
Mission, KS 66222
913/262-4511

Circle (29) on Reply Card

9N, 1945 (Fair)	800

INTERNATIONAL HARVESTER TRACTORS

1066 diesel, 1975 (Excellent)	10,400*
706, 1963 (Good)	3300
700, 1954 (Fair)	1200
624, ldr., 1968 (Fair)	2700*
560, 1961 (Fair)	2275
560 diesel, 1959 (Good)	2350
460, 1955 (Good)	1650
460 diesel, 1955 (Good)	1550
450, 1955 (Good)	1250
434, 1965 (Rough)	1600*
400, 1955 (Fair)	950*
350, 1955 (Rough)	910
340, 1960 (Fair)	1300*
300, 1954 (Fair)	900
M, 1951 (Good)	1400
M, 1950 (Good)	825
M, 1950 (Fair)	635
M, 1949 (Fair)	750
M, 1948 (Good)	850
M,	750
M, (Rough)	450
Sup. H, 1950 (Good)	810
140, cult., 1968 (Fair)	2200*
A, cult., 1948 (Good)	600
A, (Rough)	270

MASSEY-FERGUSON TRACTORS

3165, 1969 (Fair)	2600*
1150 diesel, 1971 (Good)	6500*
1100 diesel, 1971 (Good)	5700*
165, 1970 (Good)	3600
165, 1970 (Good)	3575
165, 1970 (Good)	3200*
165, 1970 (Fair)	2775
165, 1969 (Good)	3800*
165, 1969 (Good)	3375
135, 1967 (Good)	3225*
135 diesel, ldr., 1966 (Rough)	2800
85, 1963 (Good)	1760
65, ldr., 1963 (Good)	2650
65, 1963 (Good)	2100*
65, 1963 (Fair)	1685
65, 1960 (Good)	1800
50, 1961 (Fair)	1800
50, ldr., 1958, (Fair)	1875
50, 1957 (Rough)	1350
35, 1962 (Good)	2500

MINNEAPOLIS-MOLINE TRACTOR

602, 1963 (Rough)	1800*

MASSEY-HARRIS TRACTORS

33,	400
30,	420
30,	275

OLIVER TRACTORS

2050 diesel, 1969 (Fair)	5400*
1950 diesel, turbo, 1969 (Good)	6900*
1950 diesel, turbo, 1967 (Good)	4350*
1600, 1963 (Fair)	2600*
88, 1954 (Rough)	475
88, (Rough)	400*
Sup. 55, 1957 (Rough)	1425

WHITE TRACTOR

4-150, 4-W-D, 1975 (Excellent)	13,600

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

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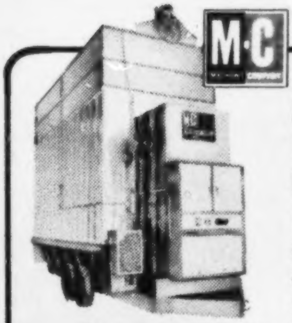
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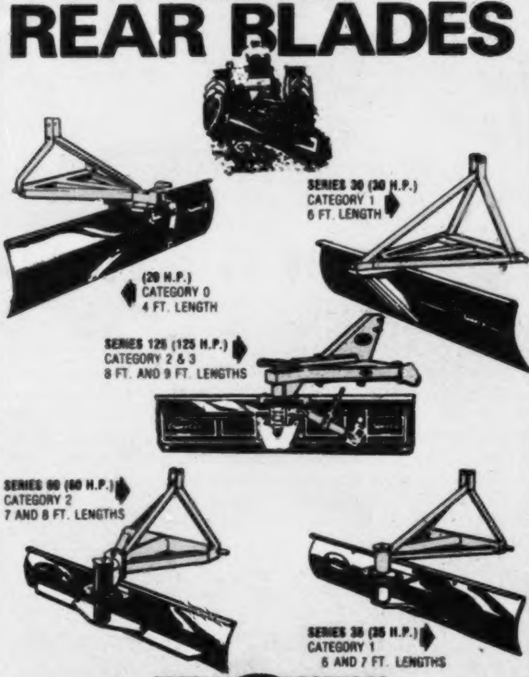

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November 7, 1979

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November 7, 1979 • Vol. 94 • No. 22

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

42nd ANNUAL STATISTICS ISSUE

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INTERTEC PUBLISHING CORP.

what's ahead...

November 7, 1979

1985: EXPECT FIERCE COMPETITION FOR DIESEL MECHANICS. Farm equipment dealers as a whole do not have a strong track record for attracting and keeping competent service personnel, but dealers who have shown a capacity for operating profitable service departments have managed to at least hold their own. However, with the gradual move by the American automobile industry toward diesel passenger cars, the competitive pressure for diesel service personnel will have to become very intense.

Robert D. Lund, general manager of the Chevrolet Motor Div. and vice-president of General Motors, told Implement & Tractor recently that by 1985, somewhere between 20 and 25 per cent of passenger cars from Detroit will be powered by diesel engines, depending on market acceptance. Editors of Ward's Auto World publications concur. If the numbers are anywhere near accurate, somewhere between two and three million diesel engines will be going into autos each year in the 1980's, and the entire American wheel tractor industry has taken the past 15 years to turn out that many diesel-driven units.

People in diesel industries have told I&T that training institutions will be increasing their capacity to turn out diesel specialists, and it is also anticipated that competent diesel service personnel in Western Europe and elsewhere outside North America will be vigorously recruited to help fill the gap. But many of them anticipate that shortages produced by the surging demand will also be met by aggressive proselytizing among all types of dealers--automobile, truck, construction and farm equipment--as well as among independent diesel service specialists and other institutions.

U.S. FARM EQUIPMENT RETAIL SALES IN SEPTEMBER showed increases in wheel tractor and combine areas but hay tools were off from the same month in 1978, according to the Farm & Industrial Equipment Institute flash report.

	Unit Retail Sales					
	September			January-September		
Equipment	1979	1978	Pct. Change	1979	1978	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-100 hp	5,285	4,928	+7.2	51,282	50,454	+1.6
Over 100 hp	4,360	4,293	+1.6	47,613	46,561	+2.3
Total 2-wheel drive	9,645	9,221	+4.6	98,895	97,015	+1.9
4-wheel drive	995	697	+42.8	7,928	6,045	+31.1
Total Tractors	10,640	9,918	+7.3	106,823	103,060	+3.7
Combines (S-P)	5,578	5,192	+7.4	20,345	19,626	+3.7
Balers*	1,816	2,036	-10.8	16,402	18,883	-13.1
Forage Harvesters**	2,237	2,321	-3.6	7,743	7,406	+4.6
Mower-Conditioners	2,290	2,590	-11.6	22,417	22,636	-1.0

*Bales under 200 lbs. **Shear-bar type

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FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

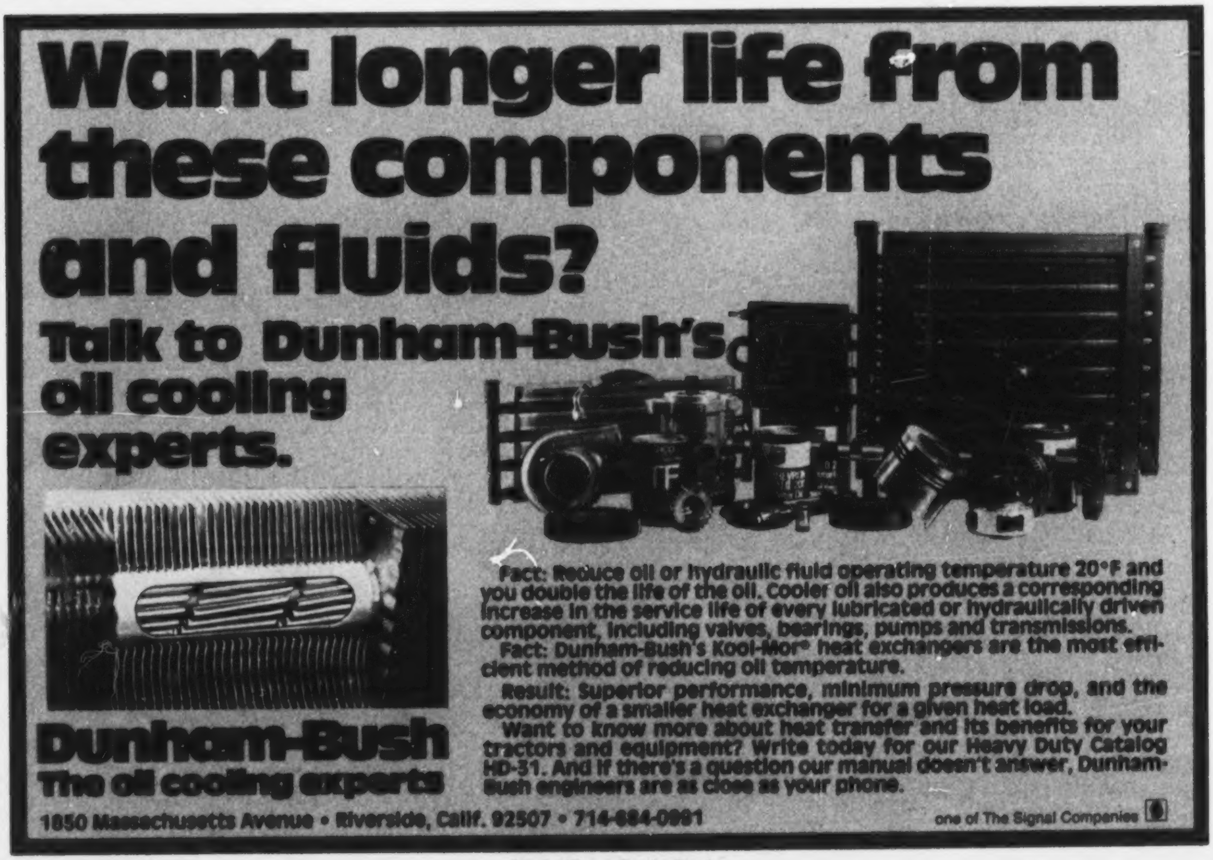
(continued)

Area, Nation	Number in Service							
	Agricultural Tractors				Combines			
	1969-71	1974	1975	1976	1969-71	1974	1975	1976
Finland	155,600	175,000	187,700	192,000	29,533	38,500	40,000	41,000
France	1,239,004	1,337,200	1,363,000	1,372,000	135,036	156,000	153,000	153,000
German D.R.	147,807	141,742	139,982	137,718	17,372	11,019	11,235	12,288
Germany, Fed.	1,368,236	1,424,949	1,441,778	1,452,661	169,769	177,900	177,900	170,900
Greece	62,160	84,043	93,424	97,000F	4,254	4,547	5,234	5,500F
Hungary	67,196	62,361	60,678	59,500	11,868	13,691	13,883	14,356
Iceland	9,881	10,100F	10,150F	10,200F	11	14F	15F	15F
Ireland	83,983	103,000*	114,217	118,000F	6,492	6,700*	6,800*	6,900*
Italy	618,732	780,602	819,334	865,715	18,530	26,912	27,774	28,766
Liechtenstein	462	433F	425	418F	.....	.....	.....	.....
Malta	142	325F	329	335F	12	10F	5	8F
Netherlands	134,098	153,700	156,529	159,000F	7,300	7,000*	6,795	6,600F
Norway	91,049	102,164	104,752	109,999	11,470	13,906	14,470	14,923
Poland	221,880	364,763	401,219	434,043	13,915	18,786	21,106	24,895
Portugal	28,511	42,024	44,452	49,660	2,505	3,654	3,815	4,113
Romania	107,793	116,816	119,533	128,024	48,247	44,211	41,077	41,602
Spain	260,578	355,554	379,070	400,928	31,769	38,335	39,674	41,218
Sweden	179,440	185,200*	189,500*	192,500*	43,633	47,900	47,800	47,700F
Switzerland	73,084	78,100	83,860	85,000F	4,456	5,300	5,026	5,000F
United Kingdom	455,886	475,796	494,738	482,871	66,005	62,000*	61,500	59,400
Yugoslavia	81,636	195,125	225,524	260,831	11,633	10,915	11,045	11,079
Oceania	429,345	434,707	434,604	434,963	69,372	64,619	63,968	63,338
Amer. Samoa	17	27F	30F	30F	.....	.....	.....	.....
Australia	329,392	332,560	332,000F	332,000F	63,549	59,483	59,000F	58,500F
Cook Islands	85	112	109	127	.....	.....	.....	.....
Fiji	1,240	1,400F	1,430F	1,450F	.....	.....	.....	.....
Fr. Polynesia	130	170F	180F	190F	.....	.....	.....	.....
Gilbert Island	9	20	14	16F	.....	.....	.....	.....

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit. FAO, 00100 Rome, Italy.

(More...)



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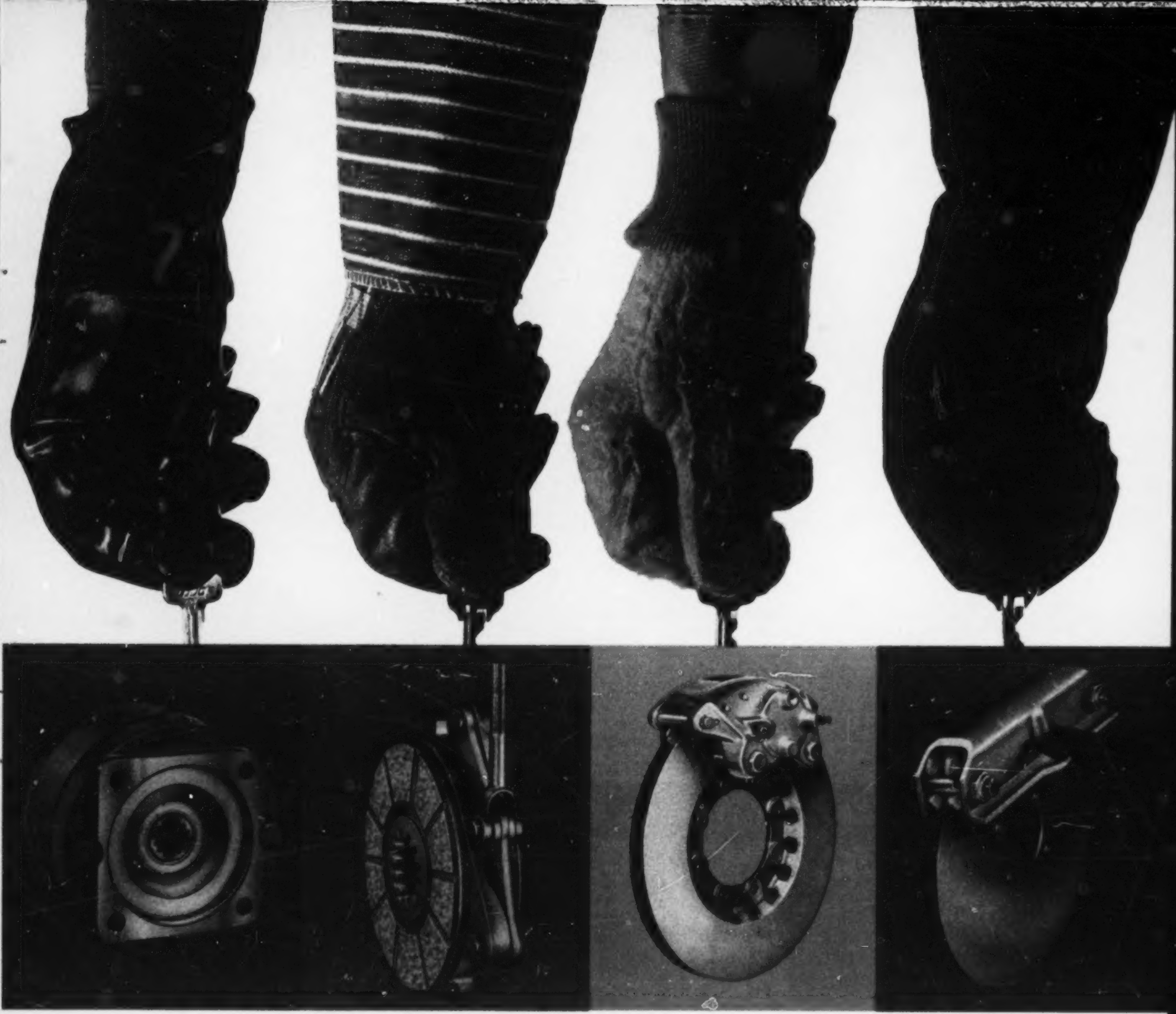

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FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

(continued)

Area, Nation	Number in Service Agricultural Tractors 1969-71	1974	1975	1976	Combines 1969-71	1974	1975	1976
Guam	70	75F	75F	75F	.....	.....	.....	.....
New Caledonia	500	580F	603	610F	5	5F	5	5F
New Hebrides	26	48F	50F	52F	.....	.....	.....	.....
New Zealand	96,389	98,289	98,700F	99,000F	5,572	4,828	4,650F	4,500F
Niue Island	7	7F	7F	7F	.....	.....	.....	.....
Norfolk Island	8	11F	11F	11F	2	2F	2F	2F
Pacific Islands	40	47F	48F	48F	.....	.....	.....	.....
Papua, N. Guin.	1,355	1,275	1,261	1,260F	243	300F	310F	330F
Samoa	16	20	20	20	.....	.....	.....	.....
Tonga	61	66	66F	67F	1	1	1F	1F
U.S.S.R.	1,976,900	2,267,000	2,336,000	2,402,000	622,367	673,000	680,000	685,000
Developed Market Economies	11,449,952	12,448,160	12,758,235	12,892,028	1,713,849	1,954,390	2,016,594	2,076,101
N. America	5,211,768	5,202,328	5,110,840	5,014,481	919,922	840,181	817,853	808,557
W. Europe	5,363,323	6,073,448	6,287,955	6,434,537	622,753	684,696	685,061	681,519
Oceania	425,781	430,849	430,700	431,000	69,121	64,311	63,650	63,000
Other	449,081	741,535	928,740	1,012,010	102,053	365,202	450,030	523,025
Developing Market Economies	1,175,070	1,570,315	1,693,291	1,793,557	127,490	146,913	152,356	157,714
Africa	149,460	181,956	187,357	192,579	13,066	14,560	14,860	15,253
Latin America	651,557	769,882	805,137	825,832	94,746	107,489	110,931	113,865
Near East	189,740	311,580	361,633	407,006	18,209	22,931	24,559	26,515
Far East	180,473	302,734	334,954	363,868	1,218	1,625	1,688	1,743
Other	3,839	4,163	4,210	4,272	251	308	318	338
Centrally Planned Economies	2,882,663	3,382,122	3,502,118	3,617,558	742,339	791,903	800,864	811,929
Asian C.P.E.	164,922	216,850	228,950	240,450	1,853	1,920	2,320	2,220
East Europe, U.S.S.R.	2,717,741	3,165,272	3,273,168	3,377,108	740,486	789,983	798,544	809,709
Developed, All	14,167,693	15,613,432	16,031,403	16,269,136	2,454,335	2,744,373	2,815,138	2,885,810
Developing, All	1,339,992	1,787,165	1,922,241	2,034,007	129,344	148,833	154,676	159,934

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit, FAO, 00100 Rome, Italy.

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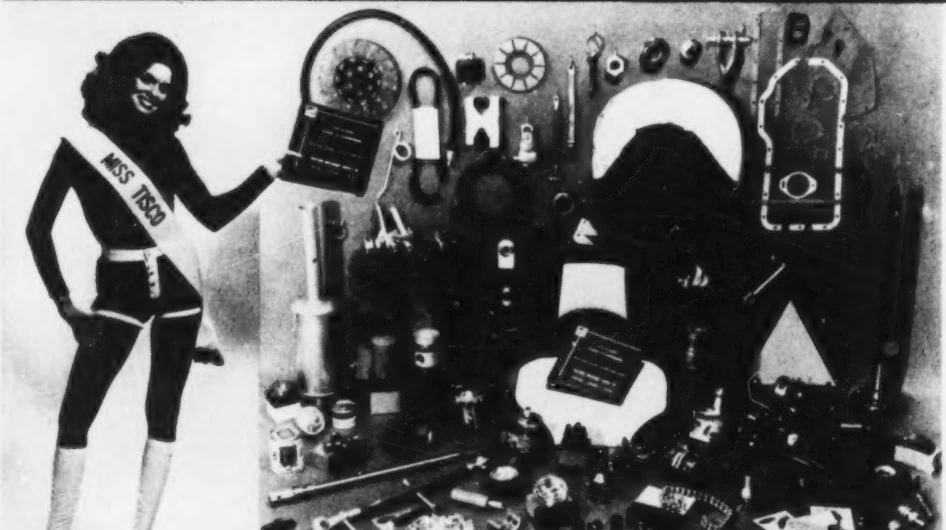

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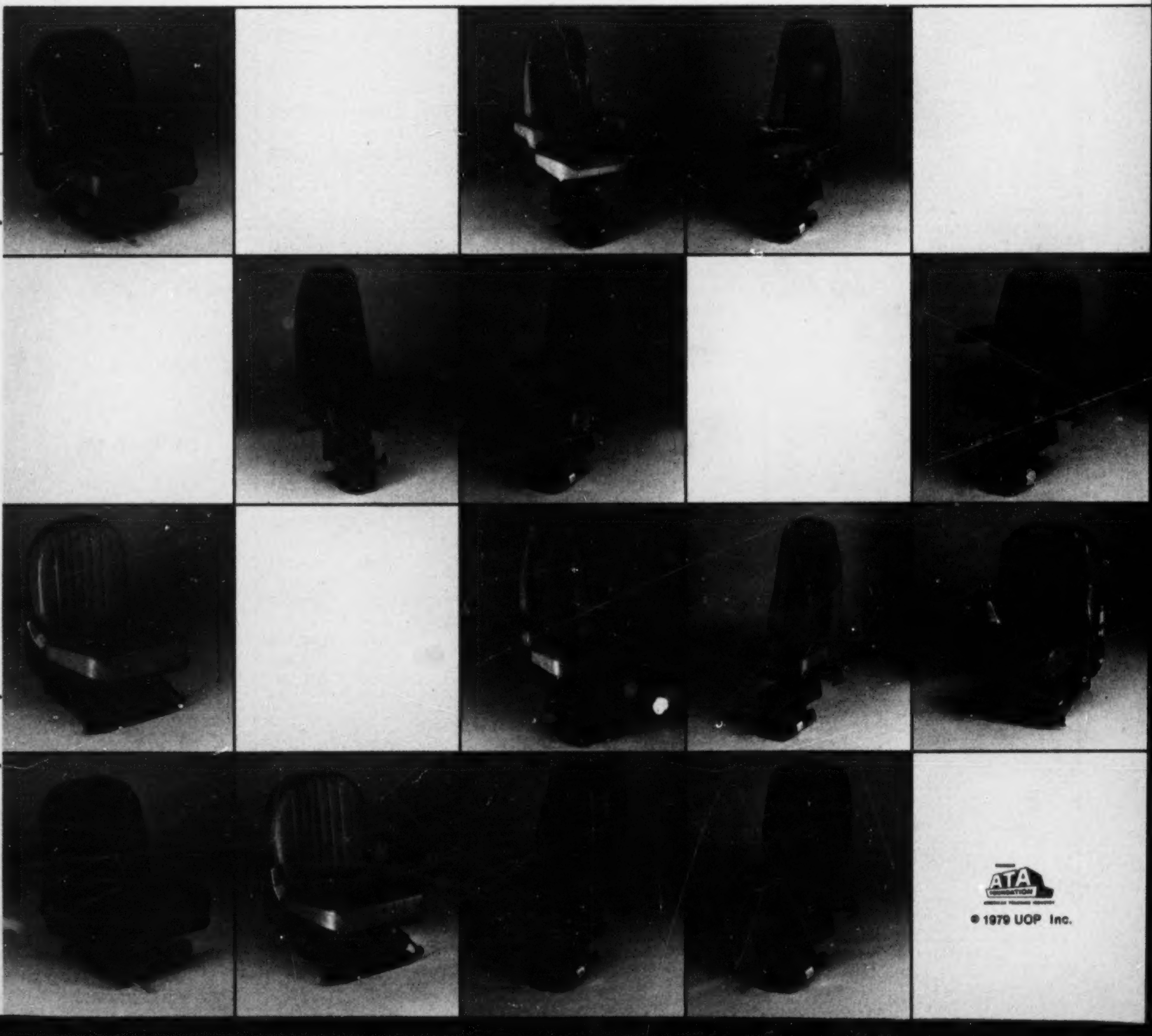

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42nd annual

MARKET STATISTICS ISSUE

■WHEN THE I&T editorial staff falls to putting together the annual Market Statistics Issue, we find that changes are developing rapidly in at least one area of industry activity and that the numbers that pass before us are not dull or routine at all.

This year, we were fortunate enough to acquire tractor import data not only for the complete year of 1978 but also for the first half of 1979. Recalling that we had generated a lot of interest in the industry with our April 21 report, "Tractors from Japan," we first began assembling similar data for the first half of 1979 to see if the leveling out of tractor imports from Japan that had been anticipated by many industry watchers was beginning to show itself.

Not so. In 1978, 60,261 wheel tractors came in from Japan and probably about 14,000 of these (placed under "not elsewhere specified" in the tables for 1978 and 1979) were garden types. In the first half of this year, 37,152 tractors came in, and approximately 2,000 of them were garden types. The valuation on tractors from Japan in 1978 came to $150.5 million; in the first half of 1979, the figure was $112 million. Japan is now the leading seller of tractors to the U.S. in terms of both dollars and units.

In all of last year, tractor imports from West Germany came to 9,261 units valued at $83.7 million. The first half of 1979 produced imports of 7,385 tractors valued at $80 million.

Some bits of information that arrive here in statistical form are so small that we have to lump them into bland categories called "other," because our space is limited. But even these minute elements suggest the possibilities of fascinating stories. For instance, with the free world's press corps speculating over the whereabouts of Idi Amin, the overthrown African despot, we wonder if anyone thought to look in the cab of the one tractor, valued at $30,000, that was imported from Uganda. That's right, Uganda.

Other entries are also somewhat mysterious. The Commerce Dept. reports that wheel tractors came in from such places as South Korea, Hong Kong, Brazil, Norway and Hungary in the past 18 months, but we've seen no trace of them.

One important caution: Import data should be read with a sense of tolerance. The person responsible for classifying and reporting them at the port of entry may have difficulty in recognizing some items for what they are, and thus drop them in the wrong slot. For instance, everybody knows that Japan doesn't make farm wheel tractors over 100 horsepower, but 455 units were thus classified that way in 1978 and 347 in the first half of 1979. The valuations average out at around $3,000 per unit, so they obviously belong in a smaller bracket.

Looking at all types of farm equipment imports, we see that Canada is still the biggest seller to the U.S. ($408 million in the first half of 1979), followed by Japan ($132 million), West Germany ($122 million) and the United Kingdom ($106 million). ☐

FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

Area, Nation	Number in Service							
	Agricultural Tractors				Combines			
	1969-71	1974	1975	1976	1969-71	1974	1975	1976
World	15,507,685	17,400,597	17,953,644	18,303,143	2,583,679	2,893,206	2,969,814	3,045,744
Africa	330,455	387,445	407,907	415,929	34,506	37,901	39,160	40,653
Algeria	47,172	50,000F	51,000F	52,000F	6,000	6,900F	7,000F	7,100F
Angola	7,207	9,000F	9,300F	9,500F	.....	.....	.....	.....
Benin	78	86F	88F	92F	.....	.....	.....	.....
Botswana	1,598	1,800F	1,850F	1,900F	45	55F	58F	60F
Burundi	4	5	5F	7F	.....	.....	.....	.....
Cameroon	150	250F	280F	300F	.....	.....	.....	.....
Cape Verde	21	27F	30F	30F	.....	.....	.....	.....
Cent. Afr. Emp.	69	110F	120F	130F	3	7F	8F	8F
Chad	93	125F	130F	140F	8	14F	15F	15F
Congo	619	647	650F	655F	27	50F	55F	57F
Djibouti	36	44F	45F	47F	.....	.....	.....	.....
Egypt	17,276	20,889	21,500F	22,000F	1,700	1,880F	1,900F	1,950F
Eq. Guinea	70	90F	95F	95F	.....	.....	.....	.....
Ethiopia	2,858	3,500F	3,600F	3,700F	77	125F	130F	135F
Gabon	750	950F	1,000F	1,050F	.....	.....	.....	.....
Gambia	61	67F	68F	70F	2	3F	3F	3F
Ghana	2,683	3,100F	3,200F	3,250F	30	150	180F	200F
Guinea	53	65F	68F	70F	.....	.....	.....	.....
Guin. Bissau	18	23F	23F	24F	.....	.....	.....	.....
Ivory Coast	1,381	2,000F	2,200F	2,300F	10	13F	15F	16F
Kenya	6,379	6,195	5,993	6,000F	658	462	431	440F
Lesotho	410	950F	980F	1,000F	3	20F	20F	25F
Liberia	175	235F	250F	260F	.....	.....	.....	.....
Libya	3,633	4,100F	4,250F	4,350F	.....	.....	.....	.....
Madagascar	2,358	2,300F	2,350F	2,400F	79	98F	100F	105F
Malawi	843	950F	970F	1,000F	.....	.....	.....	.....
Mali	363	530F	560F	600F	27	34F	35F	37F
Mauritius	284	295F	300F	305F	.....	.....	.....	.....
Morocco	12,279	18,477	20,000F	21,500F	2,500	2,624	2,700F	2,800F
Mozambique	4,198	5,400F	5,500F	5,550F	.....	.....	.....	.....
Namibia	2,050	2,250F	2,300F	2,350F	.....	.....	.....	.....
Niger	35	65	68	70F	.....	.....	.....	.....
Nigeria	2,933	7,300F	7,500F	7,700F	.....	.....	.....	.....
Reunion	269	319	325	325	.....	.....	.....	.....
Rhodesia	17,000	18,700F	19,000F	19,300F	327	440F	480F	500F
Rwanda	64	84	80F	80	.....	.....	.....	.....
Sao Tome, Etc.	114	120F	120F	122F	.....	.....	.....	.....
Senegal	297	360F	370F	380F	90	100F	110F	120F
Seychelles	18	30	30F	30F	.....	.....	.....	.....
Sierra Leone	222	240F	250F	255F	14	20F	20F	22F
Somalia	910	1,220	1,270F	1,300F	.....	.....	.....	.....
South Africa	155,042	172,000	186,000	188,000	19,400	20,611	21,500	22,500F
Sudan	5,043	8,500F	8,800F	9,000F	340	850F	900F	950F
Swaziland	1,211	1,946	1,935	1,950F	.....	.....	.....	.....
Tanzania	5,593	7,000F	7,200F	7,400F	.....	.....	.....	.....
Togo	62	100F	110F	120F	.....	.....	.....	.....
Tunisia	21,000	28,000F	29,000F	30,000F	2,593	3,200F	3,250F	3,350F
Uganda	1,283	1,743	1,731	1,656	7	9	9	9
Upper Volta	40	50F	52F	55F	.....	.....	.....	.....
Western Sahara	8	8	11	11F	1	1	1F	1F
Zaire	1,048	1,200F	1,250F	1,300F	.....	.....	.....	.....
Zambia	3,093	4,000F	4,100F	4,200F	177	235F	240F	250F
North and Central America	5,408,629	5,426,672	5,343,434	5,246,875	935,219	858,621	836,985	828,341
Antigua	133	238	226	228	.....	.....	.....	.....
Bahamas	30	50F	60F	65F	.....	.....	.....	.....
Barbados	415	460F	480F	500F	.....	.....	.....	.....
Belize	205	250F	265F	270F	12	18F	20F	22F

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit, FAO, 00100 Rome, Italy.

(*More...*)

FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

(continued)

Area, Nation	Number in Service							
	Agricultural Tractors				Combines			
	1969-71	1974	1975	1976	1969-71	1974	1975	1976
Bermuda	51	40F	36F	34	.....	.....	.....	.....
Canada	596,435	617,328	625,840	634,481	161,588	162,181	162,853	163,557
Costa Rica	5,100	5,500F	5,650F	5,700F	777	880F	900F	920F
Cuba	51,767	52,687	54,851	49,000	2,400	2,600F	2,650F	2,700F
Dominica	65	85F	87F	88F	.....	.....	.....	.....
Dominican Rep.	4,233	5,500F	5,700F	5,800F	.....	.....	.....	.....
El Salvador	2,514	2,850F	2,900F	3,000F	218	250F	260F	270F
Greenland	223	265F	270F	275F	.....	.....	.....	.....
Grenada	22	22	22F	22F	.....	.....	.....	.....
Guadeloupe	517	600	660	750	.....	.....	.....	.....
Guatemala	3,167	3,600F	3,700F	3,750F	1,550	2,250F	2,350F	2,400F
Haiti	363	420F	440F	450F	.....	.....	.....	.....
Honduras	633	950F	1,000F	1,050F	.....	.....	.....	.....
Jamaica	1,722	2,300F	2,500F	2,600F	.....	.....	.....	.....
Martinique	363	760	8[illegible]	840	.....	.....	.....	.....
Mexico	114,410	135,000F	140,000F	145,000F	10,016	12,000F	12,500F	13,000F
Montserrat	20	18	17	12	.....	.....	.....	.....
Neth. Antilles	112	120F	120F	122F	.....	.....	.....	.....
Nicaragua	500	768	1,058	1,316	.....	.....	.....	.....
Panama	2,414	3,500F	3,700F	3,800F	322	440F	450F	470F
Puerto Rico	5,385	5,603	5,249	4,886	.....	.....	.....	.....
St. Kitts, Etc.	191	208F	210F	210F	.....	.....	.....	.....
St. Lucia	40	36F	37F	37F	.....	.....	.....	.....
St. Vincent	57	81	71	75F	.....	.....	.....	.....
Trinidad, Etc.	1,850	2,050F	2,100F	2,150F	.....	.....	.....	.....
U.S.A.	4,615,333	4,585,000	4,485,000	4,380,000	758,333	678,000	655,000	645,000
Virgin Islands U.K.	3	4F	4F	4F	.....	.....	.....	.....
Virgin Islands U.S.A.	356	379	366	360	2	2	2	2
South America	454,971	545,843	572,849	593,747	79,448	89,049	91,799	94,081
Argentina	171,450	184,000F	188,000F	190,000F	34,884	39,000F	40,000F	41,000F
Bolivia	355	720F	750F	760F	143	200F	210F	220F
Brazil	168,257	236,000F	254,000	270,000F	26,000	30,000F	31,000F	32,000F
Chile	25,500	27,500F	28,000F	28,500F	9,600	10,400F	10,600F	10,700F
Colombia	22,894	23,753	24,187	24,621	1,400	1,600F	1,650F	1,700F
Ecuador	2,833	3,400F	3,550F	3,700F	400	520F	550F	570F
Falkland Island	95	112	112	114F	.....	.....	.....	.....
Fr. Guiana	35	48F	50F	52F	2	2F	2F	2F
Guyana	3,650	3,700F	3,720F	3,750F	405	420F	425F	425F
Paraguay	2,200	2,600F	2,700F	2,800F	.....	.....	.....	.....
Peru	10,902	12,000F	12,500F	12,700F	.....	.....	.....	.....
Surinam	940	1,150F	1,180F	1,200F	109	110F	112F	114F
Uruguay	26,659	27,400F	27,500F	27,550F	5,204	5,300F	5,350F	5,350F
Venezuela	19,200	23,460	26,600*	28,000F	1,300	1,497	1,900*	2,000F
Asia	803,221	1,367,210	1,633,727	1,799,984	101,894	368,337	454,297	528,103
Afghanistan	567	650F	700F	700F	.....	.....	.....	.....
Bangladesh	1,887	3,100F	3,500F	3,700F	.....	.....	.....	.....
Brunei	10	15F	18F	20F	1	2F	2F	2F
Burma	5,116	7,661	7,800F	8,000F	12	18F	20F	20F
China	135,000F	180,000F	190,000F	200,000F	.....	.....	.....	.....
Cyprus	6,810	9,500F	9,800F	10,000F	351	280	300F	320F
East Timor	86	110F	111F	113F	.....	.....	.....	.....
Hong Kong	2	6	6	6F	.....	.....	.....	.....
India	111,000	203,351	227,668	250,884	760	869	879	879
Indonesia	8,500	10,000F	10,500F	10,800F	.....	.....	.....	.....
Iran	20,167	27,000F	29,000F	30,000F	1,650	2,050F	2,150F	2,200F
Iraq	13,667	19,000F	20,222*	21,000F	3,883	4,800F	5,084*	5,200F
Israel	15,982	19,535	21,650	24,010	593	505	520	525
Japan	278,057	550,000F	721,090	800,000F	82,060	344,086	428,010	500,000F
Jordan	2,759	3,547	3,748	3,914	139	180F	190F	200F
Kampuchea	1,255	1,350F	1,350F	1,350F	20	20F	20F	20F
Korea Dpr.	19,667	24,000F	25,000F	26,000F	.....	.....	.....	.....

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit, FAO, 00100 Rome, Italy.

(More...)

FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

Area, Nation	Number in Service Agricultural Tractors 1969-71	1974	1975	1976	Combines 1969-71	1974	1975	1976
Korea Rep.	115	388	564	790	10	53	56	69
Kuwait	8	18	14	16F	.....	.....	.....	.....
Laos	339	360F	380F	400F	.....	.....	.....	.....
Lebanon	2,517	3,000F	3,000F	3,000F	60	90F	90F	90F
Mal. Peninsula	4,100	6,000F	6,300F	6,500F	.....	.....	.....	.....
Mal. Sabah	410	500F	520F	530F	.....	.....	.....	.....
Mal. Sarawak	35	60F	80F	90F	.....	.....	.....	.....
Mongolia	5,433	7,200	8,100	8,500	1,833	1,900	2,300	2,200
Nepal	358	430F	450F	460F	.....	.....	.....	.....
Pakistan	21,303	33,000F	35,714	37,000F	203	350F	378	400F
Philippines	5,633	6,200F	6,300F	6,500F	230	330F	350F	370F
Saudi Arabia	617	770F	800F	830F	160	250F	280F	300F
Singapore	37	60F	70F	75F	.....	.....	.....	.....
Sri Lanka	13,492	15,500F	15,800F	16,000F	2	3	3	3
Syria	9,131	12,864	15,303	18,567	1,410	1,744	1,812	2,146
Thailand	8,049	15,993	19,173	22,000F	.....	.....	.....	.....
Turkey	105,996	199,812	242,456	281,479	8,510	10,796	11,841	13,147
Viet Nam	3,567	4,300F	4,500F	4,600F	.....	.....	.....	.....
Yemen, A.R.	500	750F	850F	950F	.....	.....	.....	.....
Yemen, Dem.	1,050	1,180F	1,190F	1,200F	6	11F	12F	12F
Europe	6,104,164	6,971,720	7,225,123	7,409,645	740,873	801,679	803,605	806,228
Albania	6,200	8,700F	9,000F	9,200F	853	980F	1,000F	1,050F
Austria	249,050	284,414	290,000	294,000	28,247	30,693	30,500	30,200
Belgium-Lux.	97,960	103,059	104,173	108,801	9,938	10,158	9,408	10,778
Bulgaria	53,964	62,000F	64,700	65,500	9,412	9,583	10,340	10,500
Czechoslovakia	136,000	141,890	142,056	141,123	16,452	15,713	19,903	20,018
Denmark	173,831	182,660	185,000*	182,618	42,160	44,252	44,300F	44,4[illegible]9

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit, FAO, 00100 Rome, Italy.

(More...)

LR-900
Used as directed, the LR-900 will act as an engine protectant, by monitoring oil levels and adding oil when needed automatically!
CAUTION: Extensive use of Murphy Products may be habit forming
murphy
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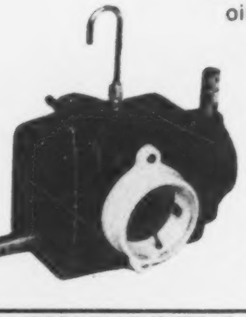
for Engine Operators

Murphy laboratories developed the LR-900 to provide fast relief for headache pain caused by daily oil check ups and mechanical failure resulting from insufficient crankcase levels. When set at the factory recommended oil level height, the **MURPHYMATIC®** LR-900 monitors crankcase lube oil level and automatically adds the proper amount prescribed by the engine manufacturer.

If something should go wrong, such as loss of oil supply, the LR-900 shuts down the engine and/or actuates an alarm.

MURPHYMATIC® LR-900 is safe to use on larger engines, too! A 1/4 inch inlet port allows for rapid refilling after an oil change. One gallon of 40-weight oil can be metered in six minutes due to the new "thumb valve metering design".

Take **MURPHYMATIC®** LR-900 and stop worrying about engine lube oil levels.



Use only as directed and remember to follow installation instructions. If severe engine problems persist, consult your engine specialist.

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FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

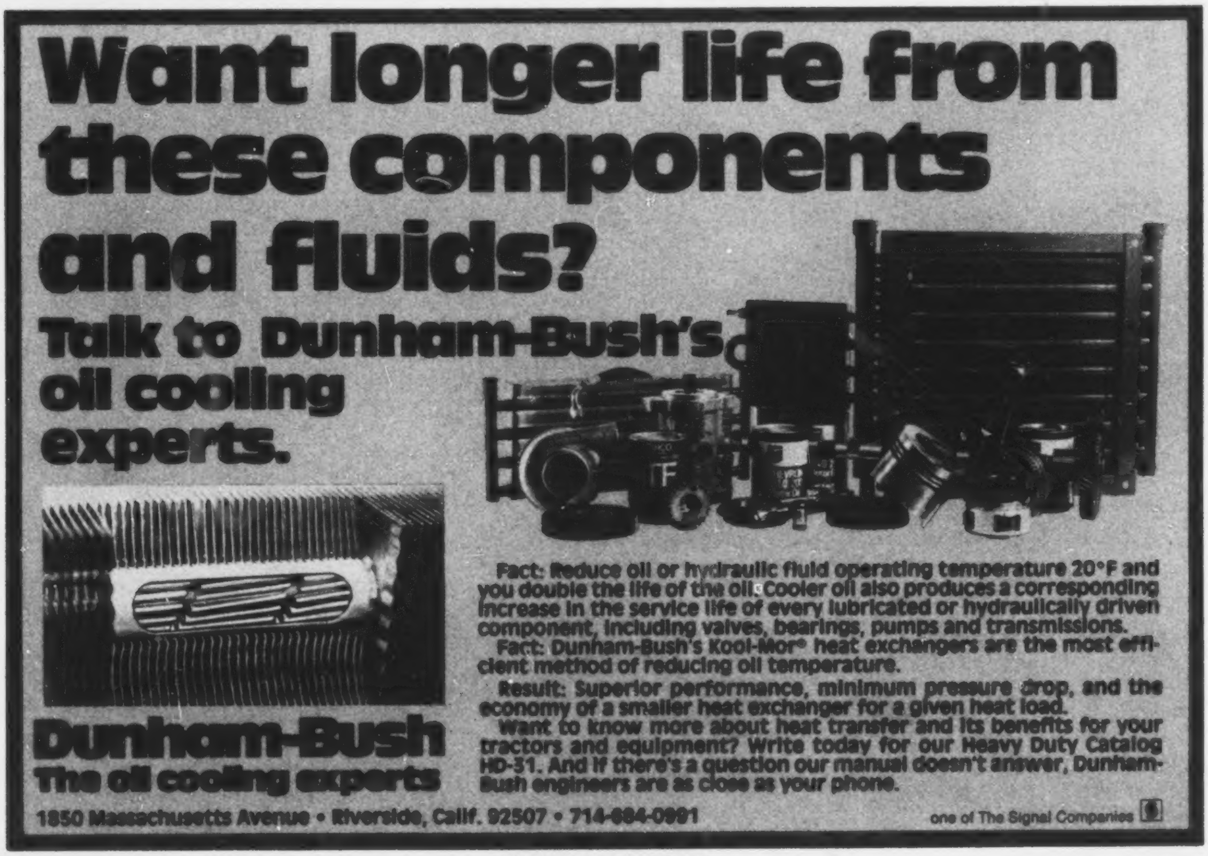
(continued)

Area, Nation	Number in Service							
	Agricultural Tractors				Combines			
	1969-71	1974	1975	1976	1969-71	1974	1975	1976
Finland	155,600	175,000	187,700	192,000	29,533	38,500	40,000	41,000
France	1,239,004	1,337,200	1,363,000	1,372,000	135,036	156,000	153,000	153,000
German D.R.	147,807	141,742	139,982	137,718	17,372	11,019	11,235	12,288
Germany, Fed.	1,368,236	1,424,949	1,441,778	1,452,661	169,769	177,900	177,900	170,900
Greece	62,160	84,043	93,424	97,000F	4,254	4,547	5,234	5,500F
Hungary	67,196	62,361	60,678	59,500	11,868	13,691	13,883	14,356
Iceland	9,881	10,100F	10,150F	10,200F	11	14F	15F	15F
Ireland	83,983	103,000*	114,217	118,000F	6,492	6,700*	6,800*	6,900*
Italy	618,732	780,602	819,334	865,715	18,530	26,912	27,774	28,766
Liechtenstein	462	433F	425	418F	.....	.....	.....	.....
Malta	142	325F	329	335F	12	10F	5	8F
Netherlands	134,098	153,700	156,529	159,000F	7,300	7,000*	6,795	6,600F
Norway	91,049	102,164	104,752	109,999	11,470	13,906	14,470	14,923
Poland	221,880	364,763	401,219	434,043	13,915	18,786	21,106	24,895
Portugal	28,511	42,024	44,452	49,660	2,505	3,654	3,815	4,113
Romania	107,793	116,816	119,533	128,024	48,247	44,211	41,077	41,602
Spain	260,578	355,554	379,070	400,928	31,769	38,335	39,674	41,218
Sweden	179,440	185,200*	189,500*	192,500*	43,633	47,900	47,800	47,700F
Switzerland	73,084	78,100	83,860	85,000F	4,456	5,300	5,026	5,000F
United Kingdom	455,886	475,796	494,738	482,871	66,005	62,000*	61,500	59,400
Yugoslavia	81,636	195,125	225,524	260,831	11,633	10,915	11,045	11,079
Oceania	429,345	434,707	434,604	434,963	69,372	64,619	63,968	63,338
Amer. Samoa	17	27F	30F	30F	.....	.....	.....	.....
Australia	329,392	332,560	332,000F	332,000F	63,549	59,483	59,000F	58,500F
Cook Islands	85	112	109	127	.....	.....	.....	.....
Fiji	1,240	1,400F	1,430F	1,450F	.....	.....	.....	.....
Fr. Polynesia	130	170F	180F	190F	.....	.....	.....	.....
Gilbert Island	9	20	14	16F	.....	.....	.....	.....

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit. FAO, 00100 Rome, Italy.

(More...)



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FARM TRACTORS AND COMBINES IN USE AROUND THE WORLD

(continued)

Area, Nation	Number in Service							
	Agricultural Tractors				Combines			
	1969-71	1974	1975	1976	1969-71	1974	1975	1976
Guam	70	75F	75F	75F	.....	.....	.....	.....
New Caledonia	500	580F	603	610F	5	5F	5	5F
New Hebrides	26	48F	50F	52F	.....	.....	.....	.....
New Zealand	96,389	98,289	98,700F	99,000F	5,572	4,828	4,650F	4,500F
Niue Island	7	7F	7F	7F	.....	.....	.....	.....
Norfolk Island	8	11F	11F	11F	2	2F	2F	2F
Pacific Islands	40	47F	48F	48F	.....	.....	.....	.....
Papua, N. Guin.	1,355	1,275	1,261	1,260F	243	300F	310F	330F
Samoa	16	20	20	20	.....	.....	.....	.....
Tonga	61	66	66F	67F	1	1	1F	1F
U.S.S.R.	1,976,900	2,267,000	2,336,000	2,402,000	622,367	673,000	680,000	685,000
Developed Market Economies	11,449,952	12,448,160	12,758,235	12,892,028	1,713,849	1,954,390	2,016,594	2,076,101
N. America	5,211,768	5,202,328	5,110,840	5,014,481	919,922	840,181	817,853	808,557
W. Europe	5,363,323	6,073,448	6,287,955	6,434,537	622,753	684,696	685,061	681,519
Oceania	425,781	430,849	430,700	431,000	69.121	64,311	63,650	63,000
Other	449,081	741,535	928,740	1,012,010	102,053	365,202	450,030	523,025
Developing Market Economies	1,175,070	1,570,315	1,693,291	1,793,557	127,490	146,913	152,356	157,714
Africa	149,460	181,956	187,357	192,579	13,066	14,560	14,860	15,253
Latin America	651,557	769,882	805,137	825,832	94,746	107,489	110,931	113,865
Near East	189,740	311,580	361,633	407,006	18,209	22,931	24,559	26,515
Far East	180,473	302,734	334,954	363,868	1,218	1,625	1,688	1,743
Other	3,839	4,163	4,210	4,272	251	308	318	338
Centrally Planned Economies	2,882,663	3,382,122	3,502,118	3,617,558	742,339	791,903	800,864	811,929
Asian C.P.E.	164,922	216,850	228,950	240,450	1,853	1,920	2,320	2,220
East Europe, U.S.S.R.	2,717,741	3,165,272	3,273,168	3,377,108	740,486	789,983	798,544	809,709
Developed, All	14,167,693	15,613,432	16,031,403	16,269,136	2,454,335	2,744,373	2,815,138	2,885,810
Developing, All	1,339,992	1,787,165	1,922,241	2,034,007	129,344	148,833	154,676	159,934

F—FAO estimate. *Unofficial figure.

Source: 1977 Production Yearbook (Vol. 31), United Nations Food & Agriculture Organization, Basic Data Unit, FAO, 00100 Rome, Italy.

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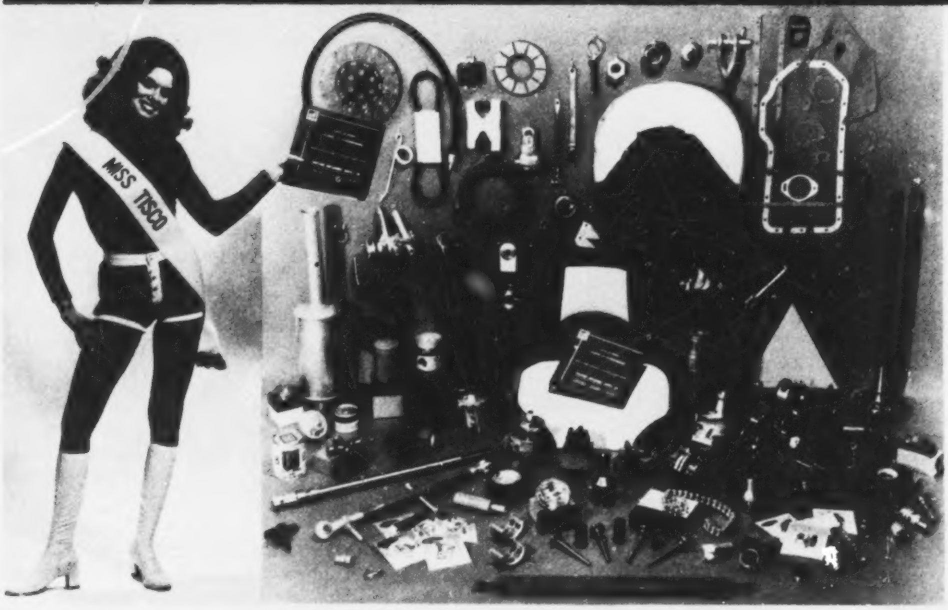

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FARM EQUIPMENT EXPORTS BY TYPE OF PRODUCT 1976-1977

Product	Jan.-Dec., 1976 Unit Quantity	Jan.-Dec., 1976 Dollar Value in Thousands	Jan.-Dec., 1977 Unit Quantity	Jan.-Dec., 1977 Dollar Value in Thousands
Planters & Transplanters	8,076	10,207	6,036	9,868
Drills & Seeders	25,090	12,162	10,821	15,554
Fertilizing Machines	85,576	22,452	12,464	20,803
Planters/Transplanters, P&A	.....	16,905	.....	15,418
Moldboard Plows	26,776	10,484	3,197	7,487
Disk Plows	26,657	20,889	12,484	20,549
Plows & Listers, NEC	24,847	6,075	4,127	4,672
Disk Harrows (excl. Plows)	9,544	13,644	4,655	13,172
Harrows, NEC, Soil Pulverizers, etc.	77,711	14,402	14,770	11,865
Cultivators, tractor-drawn or mounted	44,608	15,343	6,686	16,268
Cultivators, NEC, and Weeders	32,861	4,519	14,411	5,156
P&A for Plows, etc.	.....	36,945	.....	31,074
Combines, pull-type	2,334	21,373	2,079	23,045
Combines, self-propelled	4,977	68,309	4,627	66,224
Field Forage Harvesters	14,936	25,083	3,502	23,531
Harvesting Machines, NEC	18,215	64,470	10,675	71,285
P&A for Harvesting Mach.	.....	49,958	.....	48,861
Mowers, Cutterbar, tractor-drawn	5,599	3,468	5,067	3,650
Hay Rakes & Tedders	2,530	1,914	2,558	2,208
Pickup Hay Balers	12,821	37,459	10,208	33,417
Mowers, Rotary, tractor-drawn (excl. lawn mowers)	2,352	2,566	2,045	2,501
Haying Machines, NEC, & Mowers, NEC	3,149	7,735	2,603	7,650
P&A for Haying Machinery	.....	18,094	.....	22,445
Wheel Tractors, NEC, 9-34 PTO HP	8,464	13,918	11,160	15,150
Wheel Tractors, NEC, 35-39 PTO HP	3,112	14,568	2,314	13,716
Wheel Tractors, NEC, 40-49 PTO HP	420	2,466	460	3,491
Wheel Tractors, NEC, 50-59 PTO HP	1,846	16,180	1,435	14,108
Wheel Tractors, NEC, 60-69 PTO HP	3,585	36,593	3,113	35,223
Wheel Tractors, NEC, 70-79 PTO HP	1,136	13,641	1,021	13,005
Wheel Tractors, NEC, 80-89 PTO HP	1,917	23,959	1,598	22,854
Wheel Tractors, NEC, 90-99 PTO HP	2,946	34,581	1,679	21,019
Wheel Tractors, NEC, 100 HP plus	22,070	371,487	15,312	296,396
Garden Tractors & Motor Tillers	116,341	43,795	111,337	48,049
Wheel Tractors, Used	13,174	36,980	6,113	21,890
P&A, NEC, Wheel Tractors	.....	320,257	.....	363,169
Farm Elevators & Blowers	1,359	2,656	1,307	3,307
P&A, NEC, for Farm Elevators & Blowers	.....	1,733	.....	846
Sprayers, Agri. & Pesticidal, Power Operated	123,572	18,204	185,045	29,365
Sprayers, Agri. & Pesticidal, Hand Operated	4,430,250	5,476	2,908,954	7,525
Parts, NEC, for Agri. & Pesticidal Sprayers	.....	22,680	.....	23,239

SOURCE: U.S. Dept. of Commerce, Industry & Trade Administration.
NEC—Not elsewhere counted or classified.
P&A—Parts and attachments.

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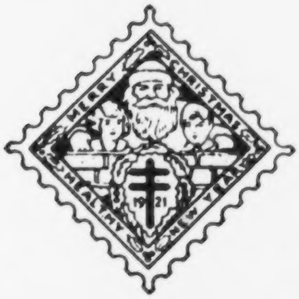
Christmas Seals from the past for the future.



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FARM EQUIPMENT EXPORTS BY TYPE OF PRODUCT, 1978

Product	Unit Quantity	Dollar Value in Thousands
Combines, pull-type	2,347	28,546
Combines, self-propelled	5,716	103,658
Cultivators, tractor-drawn or mounted	4,427	9,419
Cultivators, NEC, and Weeders	7,862	5,034
Farm Elevators and Blowers	2,956	7,264
Farm Wagons and Carts	5,538	4,160
Parts for Farm Wagons and Carts	.....	2,112
Fertilizing Machines	18,138	20,297
Harrows, Disk	7,809	20,112
Harrows, NEC, & Soil Pulverizers	11,918	11,311
Parts for Harrows, Stalk Cutters & Soil Pulverizers	.....	14,560
Harvesting Machines, NEC	9,936	64,363
Harvesting Machine Parts	.....	76,248
Hay Balers	8,887	32,529
Haying Machines, NEC (incl. rakes & tedders)	7,939	15,685
Parts for Haying Machines	.....	27,141
Mowers, Cutterbar, tractor-drawn	2,555	4,073
Mowers, Rotary, tractor-drawn (excl. lawn mowers)	3,271	3,431
Mowers, NEC, tractor-drawn (excl. lawn mowers)	2,749	6,126
Planting Machines	4,536	6,869
Plows, Disk	6,311	8,301
Plows, Moldboard	3,043	7,354
Plows & Listers, NEC	5,199	7,831
Parts for Plows, Listers, Cultivators & Weeders	.....	27,302
Seeding Machines	10,682	16,531
Parts for Planting, Seeding & Fertilizing Machines	.....	19,261
Farm Tractors:		
Under 40 PTO HP	4,426	14,932
40-59 PTO HP	1,970	15,846
60-79 PTO HP	2,955	29,761
80-99 PTO HP	2,673	41,217
100-119 PTO HP	4,628	81,263
120-139 PTO HP	5,293	98,064
140-159 PTO HP	2,530	56,603
160-179 PTO HP	840	23,395
180 HP & Over	2,052	63,043

SOURCE: U.S. Dept. of Commerce, Industry & Trade Administration.
NEC—Not elsewhere counted or classified.
P&A—Parts and attachments.

For complete listing of manufacturers and addresses, see the

I&T PRODUCT FILE

published annually on March 31

NEW! Brownie
Spring-tension
LOAD BINDER

. . . entrapped spring exerts constant 1/8 ton pull on chains up to 1/4" . . . stress load per unit is 2000 pounds! Cushions shocks which damage loads. "Yielding" loads like plastic and aluminum irrigation pipe or recreational and boat trailers need the built-in "inch-of-give" or "compensating take-up" these load binders provide. Made by the same folks who've manufactured the famous Brownie CHAIN TIGHTENER used by livestock truckers for nearly a third of a century.

Dealerships Available

Brownie
MANUFACTURING COMPANY INC
402-786-2715 WAVERLY, NE 68462

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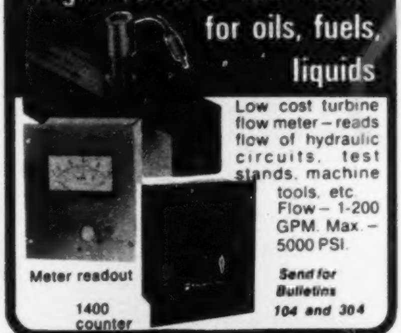


High Pressure Flow Meter for oils, fuels, liquids

Low cost turbine flow meter – reads flow of hydraulic circuits, test stands, machine tools, etc. Flow – 1-200 GPM. Max. – 5000 PSI.

Meter readout
1400 counter

Send for Bulletins 104 and 304

Circle (17) on Reply Card

Universal hydraulic test unit measures GPM, PSI, F, RPM –

all from one point in the system. Can be switched instantly to remote sensors for GPM, RPM, °F ratings – even when no hydraulic tests are being performed.

Send for Bulletin 202

Circle (18) on Reply Card

Flo-tech, Inc.
103 S. Washington Blvd. Mundelein
Illinois 60060 Phone 312 566-9120

VALUE OF FARM EQUIPMENT EXPORTS BY COUNTRY OF DESTINATION, 1978

Value in thousands of dollars.
(Excluding agricultural tractor parts)

Western Hemisphere			
Canada	$663,017	Venezuela	$ 53,037
Mexico	82,339	Trinidad	1,673
Guatamala	8,560	Ecuador	6,242
Salvador	4,457	Bolivia	2,247
Honduras	6,276	Chile	2,597
Nicaragua	3,786	Brazil	1,509
Costa Rica	7,329	Uruguay	2,238
Panama	3,175	Paraguay	1,036
Jamaica	1,780	Argentina	4,028
Dominican Republic	2,823	Other W. Hemisphere	4,697
Colombia	12,584	Total W. Hemisphere	875,410
Europe			
Sweden	$ 8,542	Austria	$ 1,315
Finland	1,014	Hungary	13,068
Norway	409	Switzerland	2,131
Denmark	2,718	U.S.S.R.	1,862
United Kingdom	14,367	Spain	7,994
Ireland	1,075	Italy	6,506
Netherlands	10,715	Yugoslavia	8,128
Belgium	10,152	Greece	6,428
France	44,136	Other Europe	1,382
West Germany	17,927	Total Europe	159,869
Middle East			
Turkey	$ 1,451	Saudi Arabia	$ 6,490
Iran	17,861	Other Middle East	2,747
Israel	11,139		
Jordan	1,590	Total Middle East	41,278
Asia and Pacific			
Thailand	$ 2,639	New Zealand	$ 3,813
Indonesia	2,594	China (Taiwan)	1,140
Philippines	3,356	China	1,080
S. Korea	3,024	Other Asia-Pacific	3,925
Australia	68,974	Total Asia-Pacific	90,545
Africa			
Lybia	$ 16,188	Nigeria	$ 3,989
Egypt	13,200	Kenya	1,990
Sudan	4,394	Rep. South Africa	18,833
Ivory Coast	5,683	Other Africa	5,215
Ghana	1,708	Total Africa	71,200

Total Exports, Agricultural Tractors & Equipment	$1,257,285
Exports of Agricultural Tractor Parts	326,000
Total Exports	$1,583,285

Source: U.S. Dept. of Commerce, Industry & Trade Administration.

Don't sell too low...
and don't pay
too much... stay up-to-date
on used equipment values with I&T

IMPORTS OF FARM EQUIPMENT BY PRODUCT

Product	Jan.-Dec., 1977 Quantity	Jan.-Dec., 1977 Value in Thousands of Dollars	Jan.-Dec., 1978 Quantity	Jan.-Dec., 1978 Value in Thousands of Dollars	Jan.-June, 1979 Quantity	Jan.-June, 1979 Value in Thousands of Dollars
Knives & Cutting Blades	7,441,408	3,738	6,864,882	4,905	3,163,962	1,998
Plows & Listers	11,140	16,772	6,847	9,142	6,175	6,337
Cultivators & Weeders	18,140	22,337	13,952	18,356	10,212	14,989
Parts of Plows, Cultivators, Weeders & Listers	.....	23,235	.....	23,501	.....	15,079
Harrows, Rollers, Stalk Cutters, Soil Pulverizers	22,251	13,750	48,977	8,580	18,113	5,774
Planting, Seeding & Fertilizing Machinery	36,035	49,338	46,919	39,634	17,912	19,861
Haying Machinery other than Mowers	8,978	10,895	6,582	8,464	6,717	12,467
Mowers except Lawn Mowers	11,654	10,670	11,581	13,450	11,850	12,929
Harvesting Machines, NES	30,858	232,030	22,382	226,333	11,286	148,187
Farm Wagons & Carts	20,447	9,704	10,546	9,304	6,490	6,592
Agricultural Machines & Implements, NES	.....	46,845	.....	62,436	.....	47,792
Parts of Agricultural Machines, NES	.....	140,791	.....	131,725	.....	96,125
Tractors, Agricultural, Wheel-Type, New, excluding Industrial*	55,390	263,249	92,049	448,216	58,000	329,248
Tractors, Agri., Used	3,333	17,238	4,284	23,435	2,318	14,809
Parts for Agri. Tractors	.....	311,894	.....	307,704	.....	230,449

SOURCE: U.S. Dept. of Commerce, Industry & Trade Administration.

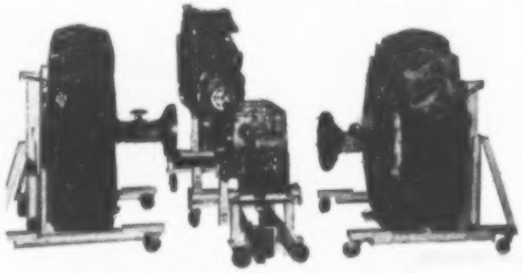
NES—Not elsewhere specified.

*Use of the term "industrial" here is understood to refer to such machines as fork-lifts but not to industrial tractors as commonly defined in the farm and industrial equipment industry.

COFER

**Heavy Duty
Tractor Splitting Stands
and Tire Carts**

PATENTS APPLIED FOR



- 60 Day satisfaction guarantee
- 1 set of stands fits all tractors (frame or frameless)
- One man installation in less than 5 minutes
- Heavy 6" castors for easy roll

*LIKE ADDING A GOOD MAN
TO YOUR SHOP*

Cofer Sales & Manufacturing Co.
1011 Central Dodge City, K[illegible] 67801 (316) 227-6170

Circle (29) on Reply Card

Hahn
P-61 PUMP

**put a proven
performer
at the
heart
of your
sprayer**

since 1948

- BELT OR PTO DRIVE ■ UP TO 15 G.P.M.
- POSITIVE DISPLACEMENT ■ 0 to 150 P.S.I.
- SELF-PRIMING ■ EASY WEAR-ADJUSTMENT

Hahn DEALERS WANTED
1625 N. Garvin St. Evansville, IN 47711 (812) 428-2025

Circle (30) on Reply Card

DOLLAR VALUE OF FARM EQUIPMENT IMPORTS BY COUNTRY OF ORIGIN, Jan., 1975-June, 1979

(In thousands)

Country	Jan.-Dec. 1975	Jan.-Dec. 1976	Jan.-Dec. 1977	Jan.-Dec. 1978	Jan.-June 1979
Canada	$544,661	$601,760	$619,662	$506,728	$408,755
Mexico	7,595	7,300	8,363	6,277	4,962
Brazil	NA*	NA*	NA*	2,194	560
Sweden	997	941	2,077	1,708	2,738
Norway	1,351	1,666	1,751	1,075	668
Denmark	5,619	4,931	4,054	4,513	3,880
Netherlands	13,859	13,638	13,560	12,690	10,813
United Kingdom	103,853	102,208	110,071	125,241	106,079
Belgium	76,100	75,979	78,191	66,347	48,785
France	39,060	36,386	36,715	36,351	38,629
West Germany	93,787	90,139	118,861	141,392	122,606
Austria	625	2,255	1,219	783	620
Hungary	2,531	6,978	4,474	4,673	4,936
U.S.S.R.	3,917	1,806	1,415	1,113	249
Poland	5,006	582	3,705	1,746	535
Romania	8,465	10,029	10,451	8,372	6,161
Italy	33,134	32,077	50,246	75,066	40,325
Spain	5,338	4,614	4,326	3,768	4,247
Israel	483	882	940	1,545	1,357
New Zealand	762	1,396	2,525	1,918	2,611
Australia	7,116	4,988	3,642	3,218	2,924
Japan	25,610	39,360	73,861	167,858	131,746
China (Taiwan)	NA*	NA*	1,273	1,446	1,197
South Africa	NA*	NA*	3,830	3,972	2,353
Others	7,270	9,490	2,347	2,762	2,667
TOTAL	$997,139	$1,049,405	$1,157,560	$1,182,758	$950,408

SOURCE: U.S. Dept. of Commerce, Industry & Trade Administration.

*Data not available, included with "others."

DEUTZ... The intelligent choice for a dealership that's different.

1. A complete line of 43 to 140 PTO hp tractors. Powered by the world-famous Deutz air-cooled diesel engine. All models available with high performance 4-wheel or 2-wheel drive. **2. Known for superior fuel economy.** Owners attest to substantial savings over most liquid-cooled engines. **3. Less downtime** because Deutz has eliminated the liquid cooling system, the major source of engine trouble. **4. Quality construction,** as evidenced by the fact that Deutz cylinder heads are machined so precisely that head gaskets are not used, except on turbo-charged models. **5. Service is easier and faster.** Snap off a few panels and you have easy engine accessibility. Most engine parts are interchangeable as are many transmission and hydraulic parts. You can serve your customers better with a smaller parts inventory than other lines require. **6. Powerful performance,** because Deutz uses highly efficient mechanical-drive transmissions with velvet-smooth synchromesh on most models. POWERMATIC HI-LO on DX 140 and DX 160. **7. Saleable features** such as: new luxurious MasterCab, new Multi-Fit seat, safety frames with canopies, weather enclosures, Deutz Claw Hitch, new push-pull hydraulic couplers and many more. **8. Good profit margin** at competitive prices. **9. Excellent warranty,** for 1500 hours or two years covering engine and power trains on new tractors. **10. Generous support.** Contact your nearest Deutz Region Office today to find out about floor plan, retail financing, volume bonus, performance bonus and other profit-making features.

Join Deutz, the new power in the country.

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7585 Ponce de Leon Circle Atlanta, GA 30340 404/449-6140

Southern Region
7585 Ponce de Leon Circle
Atlanta, GA 30340
404/449-4015

Central Region
4818 Kimmel Drive
Davenport, IA 52802
319/326-2581

North Central Region
3600 Parkway Lane
Hilliard, OH 43026
614/876-7334

Ontario Dealers
Contact
North Central Region

DEUTZ

Circle (24) on Reply Card

WHEEL TRACTOR IMPORTS 1977

New, Agricultural, excluding garden

Country of Origin	UNDER 35 BHP Unit Quantity	UNDER 35 BHP Value in Thousands of Dollars	UNDER 35 BHP Value Ratio 77/76	OVER 35 BHP Unit Quantity	OVER 35 BHP Value in Thousands of Dollars	OVER 35 BHP Value Ratio 77/76	N.E.S. except Industrial* Unit Quantity	N.E.S. except Industrial* Value in Thousands of Dollars	N.E.S. except Industrial* Value Ratio 77/76
Canada	8	108	3.183	1,295	42,621	.97	981	22,527	10.30
United Kingdom	110	485	.57	5,125	29,194	1.17	384	1,849	.48
U.S.S.R.	1	3	NA	6	34	.22	294	1,275	.81
Japan	11,556	24,779	2.47	7,059	18,319	2.37	10,390	16,931	1.44
W. Germany	1,066	7,609	.82	3,689	28,311	.93	4,522	32,897	4.32
Italy	30	68	2.79	2,502	12,475	4.11	532	4,684	1.25
Brazil	49	141	NA	4	53	NA	.....	.....	.....
France	.....	.....	.....	13	411	.95	18	624	1.36
Poland	.....	.....	.....	575	2,889	NA	.....	.....	.....
Romania	.....	.....	.....	4,435	10,571	1.04	1	7	NA
Mexico	.....	.....	.....	3	33	NA	24	168	NA
Netherlands	.....	.....	.....	6	44	.92	.....	.....	.....
Spain	.....	.....	.....	4	19	NA	35	324	NA
Belgium	.....	.....	.....	257	1,970	13.34	148	1,238	.33
Sweden	.....	.....	.....	.....	.....	.....	2	118	70.08
Austria	.....	.....	.....	.....	.....	.....	26	474	NA
Norway	......	.....	.....	.....	.....	.....	19	37	NA
Hungary	.....	.....	.....	.....	.....	.....	119	441	1.65
Yugoslavia	.....	.....	.....	.....	.....	.....	2	15	NA
TOTALS	12,820	33,193	1.53	24,973	146,477	1.21	17,597	83,609	2.37

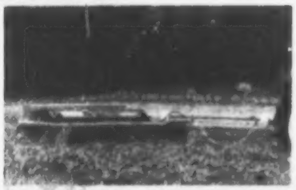
SOURCE: U.S. Dept. of Commerce, Industry & Trade Administration.

*Use of the term "industrial" here is understood to refer to such machines as fork-lifts but not industrial tractors as defined in the farm and industrial equipment industry.

N.E.S.—Not elsewhere specified.

DEUTZ-FAHR...
The intelligent choice
for an additional profitable line.

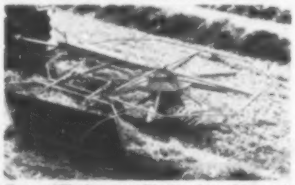
A Deutz-Fahr dealership can be as valuable and profitable to you as it is to hundreds of successful Deutz dealers in North America. Farmers are keenly aware of the need to retain maximum protein in hay and forage. And that's what the Deutz-Fahr complete circle haymaking system is all about. Check the features below and you'll see many of the selling advantages offered by Deutz-Fahr equipment. Then consider the generous floor planning and retail financing available through our own subsidiary — the reliable, helpful back-up from our district managers, service representatives, and regional staff — plus the solid Deutz-Fahr reputation for quality — and you have the reasons why you should talk with us now about a profitable Deutz-Fahr dealership.



KM 400 1 pull-type Turbo Drum Mower gives amazingly high output as it slides uniformly over the ground. Fast, efficient. Has 9' cutting width. Four mowing drums. Eight blades. Available with tractor drawbar or lateral flotation equipment.

KM 22 or 26 Turbo Drum Mower. Counter-rotating drums assure clean, non-stop, high-speed mowing without plugging, even when crop is damp. Two 3-pt hitch models, 5'6" to 7' cutting widths, cut five to ten acres per hour. Plus a host of other sales features that make it a real winner.

Centipede Haymaker lifts, turns, fluffs, spreads and flexes stems to release moisture. Provides maximum yields with higher protein content due to fast air-drying. Has 15'4" working width. Available in 3-pt hitch or pull type models. A money-maker for farmers and you.



Rotary Windrower with circular raking patterns provides clean tangle-free aerated windrows. Gentle turning of wet crops after rain. Gentle handling prevents leaf loss, thus retaining maximum protein. Available in 3-pt hitch or pull type models.

DEUTZ FAHR
The gentle power in the hayfield.

DEUTZ Corporation, Agricultural Equipment Division
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Southern Region
7585 Ponce de Leon Circle
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Central Region
4818 Kimmel Drive
Davenport, IA 52802
319/326-2581

North Central Region
3600 Parkway Lane
Hilliard, OH 43026
614/876-7334

Ontario Dealers
Contact
North Central Region

Circle (25) on Reply Card

NEW AGRICULTURAL WHEEL TRACTOR IMPORTS, 1978

(Excludes garden tractors except as indicated in headings, footnotes.)
Number of units/Value in thousands of dollars

Nation of Origin	Under 40 HP*	40-79 HP*	80-99 HP*	100 HP and over*	HP Not Specifically Provided*	Not Elsewhere Specified, Excluding Industrial, Including Garden Types**	TOTALS
Canada	100/$232	246/$2,667	296/$8,316	761/$24,263	1,532/$53,033	873/$17,673	3,808/$106,157
United Kingdom	342/1,625	924/6,306	1,382/8,238	56/525	1,308/8,921	5,171/34,387	9,183/60,002
Belgium	10/62	390/2,799	.....	126/983	93/701	217/1,446	836/5,991
France	.....	22/827	.....	.....	13/281	1,361/250	1,396/1,358
West Germany	414/2,113	3,727/27,326	1,308/14,201	1,059/11,708	1,634/15,862	1,119/12,545	9,261/83,755
Poland	150/748	.....	.....	60/516	20/112	.....	230/1,376
Italy	615/2,178	623/2,751	495/4,347	28/141	432/12,187	801/6,117	2,994/27,721
Rumania	1,371/4,727	1,297/2,945	.....	.....	3/23	177/458	3,448/8,153
Spain	.....	142/678	4/21	1/21	9/52	4/22	160/794
U.S.S.R.	.....	46/172	.....	.....	3/18	100/652	149/842
Norway	.....	.....	.....	.....	.....	86/201	86/201
Hong Kong	83/298	.....	.....	.....	.....	.....	83/298
Japan	42,626/115,416	1,440/8,937	60/188	455/1,491	1,681/4,277	13,999/20,147	60,261/150,456
Hungary	.....	.....	.....	.....	.....	84/235	84/235
Other	29/113	34/659	1/14	1/17	1/3	4/40	70/846
TOTALS	46,340/$127,512	8,891/$56,068	3,546/$35,325	2,547/$39,667	6,729/$95,470	23,996/$94,174	92,119/$449,062

Source: U. S. Dept. of Commerce, Industry & Trade Administration.

*Excluding garden tractors. **Including garden types. The term "industrial" here is understood to refer to such machines as fork-lifts, but not industrial tractors as defined in the farm and industrial equipment industry.

COUNT ON W W TO...
DOUBLE YOUR FASTENER SALES
YOUR CONVENIENCE!

Western Wire's unique single unit price practically does the selling for you!

"One-Price Pak" Poly-bagged Hitch Pin Clips

"Full Value Package" Boxed Cotter Pins

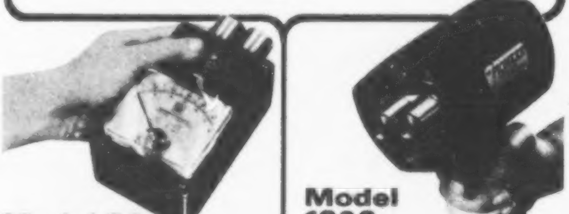
- 10 self-serve units in each package
- Each unit priced the same
- Quantity of fasteners varies according to size

WESTERN WIRE
PRODUCTS COMPANY
1415 South 18th St. • St. Louis, Mo. 63104

Circle (32) on Reply Card

PIONEER TACHOMETERS
MEASURE RPM INSTANTLY
No Electrical or Mechanical Connections Required

USE FOR:
GRINDERS
DRILL PRESSES
ENGINES
LATHES
MOTORS



Model 36

Self contained, easy-to-use. Hold like flashlight and measure speeds up to 12,000 RPM. No wires or mechanical connections required. Just point, press button and read RPM.

Model 1030

Unique Tachometer Gun is easy-to-use. Self contained power unit. Measure RPM in 4 speed ranges: 1,000-3,000-10,000-30,000. Solid State Transistorized circuits. Many other features.

Write Today For More Information

PIONEER ELECTRIC & RESEARCH CORP.
743 Circle Avenue, Forest Park, Illinois 60130

Circle (33) on Reply Card

NEW AGRICULTURAL WHEEL TRACTOR IMPORTS, JAN.-JUNE, 1979

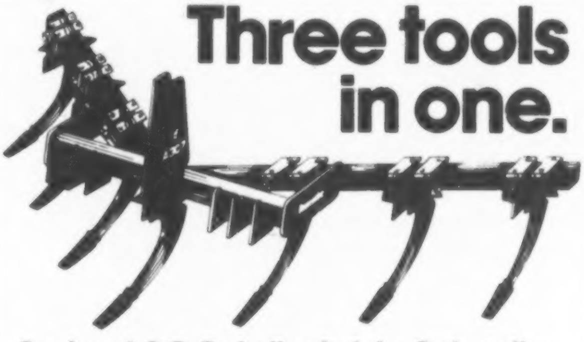
(Excludes garden tractors except as indicated in headings, footnotes.)
Number of units/Value in thousands of dollars

Nation of Origin	Under 20 HP*	20-29 HP*	30-39 HP*	40-79 HP*	80-99 HP*	100 HP and Over*	HP Not Specifically Provided*
Canada	9/$29	12/$30	66/$271	302/$5,079	179/$5,247	445/$15,563	748/$33,000
United Kingdom		109/617	237/1,304	3,219/25,930	2,585/17,821	24/195	90/641
Belgium	1/7		3/20	23/224			12/156
West Germany	1/4		25/178	4,333/38,190	1,454/18,418	1,170/18,454	275/3,291
Italy	72/313	168/583	81/304	818/6,607	178/2,162	3/63	11/73
Rumania	242/1,112		685/1,271	1,287/3,013			7/67
Spain				64/506			14/94
U.S.S.R.		50/59					
Japan	10,976/27,892	12,035/40,144	10,557/33,909	701/5,318		347/670	505/1,308
Others				15/247		1/30	
TOTALS	**11,301/$29,358**	**12,374/$41,434**	**11,654/$37,258**	**10,762/$85,114**	**4,396/$43,647**	**1,990/$34,976**	**1,662/$38,627**

Source: U. S. Dept. of Commerce, Industry & Trade Administration.

*Excluding garden tractors. **Including garden tractors. The term "industrial" here is understood to refer to such machines as fork-lifts, but not industrial tractors as defined in the farm and industrial equipment industry.

Three tools in one.



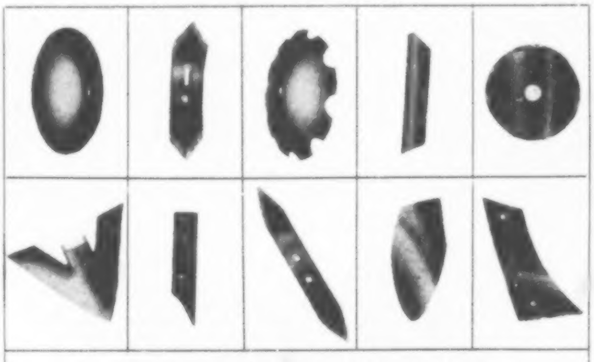
Series A300 Adjustable Subsoiler, Super Chisel Plow from Barrentine

- Acts as subsoiler, chisel plow and water management tool.
- Adjustable shanks with chrome-plated brackets for long life, easy adjustment from 15" to 21" centers.
- True parabolic tynes trip independently, feature 16" draft with maximum rating of 12 horsepower per shank.
- Available in 5 to 13 shank models with main frame constructed in modified V shape and double braced for extra strength.

Dealerships Available. Write
Marketing Dept. IT, P.O. Box 700,
Greenwood, MS 38930 or call toll
free 1-800-647-9358

Barrentine Manufacturing Company

Circle (35) on Reply Card



VELDMASTER

Our formula is simple

Durability: Veldmaster's high-quality steel is produced and processed in our own mill

Service: Warehouse stocks available in key USA locations to provide in-season delivery

Price: As always—the competitive alternative

Products: Disc Blades • Plow Shares • Rock Shares • Moldboards • Landsides • Shins • Plow Bottoms • Sweeps • Tines-Shanks • Tillage Parts • Cutting Parts for Mowers, Combines and Swathers • Linkage Parts

Warehouse Locations

Locations include our giant new facility in Des Moines, IA.
Plus warehouses in Fresno, CA and Charleston, SC.
Distributors: Some select territories still available

Veldmaster, Inc.
34 South Broadway,
White Plains, NY 10601
(914) 761-1234

FEMA

Circle (36) on Reply Card

Not Elsewhere Specified, Excluding Industrial, Including Garden Types**	Totals	
299/$4,188	2,060/$63,407	Canada
984/7,434	7,248/53,942	United Kingdom
	39/407	Belgium
127/1,512	7,385/80,047	West Germany
297/2,573	1,628/12,678	Italy
2/22	2,223/5,495	Rumania
27/242	105/842	Spain
12/103	62/162	U.S.S.R.
2,031/2,714	37,152/111,955	Japan
82/47	98/324	Others
3,861/$18,834	58,000/$329,248	TOTALS

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Circle (37) on Reply Card

Value of Shipments, 1974-1978

(In thousands of dollars)

I—Farm Machines and Equipment

	1978	1977	1976	1975	1974
Planting, Seeding and Fertilizing Machinery	499,070	550,782	516,847	480,273	354,436
Harrows, Rollers, Pulverizers, Stalk Cutters	466,621	465,974	478,322	476,274	394,993
Plows	190,844	239,151	266,660	250,134	182,301
Harvesting Machinery	1,782,295	1,599,722	1,435,307	1,253,430	1,093,207
Haying Machinery	522,370	469,715	508,250	481,334	407,652
Farm Dairy Machines and Equipment	109,116	97,347	77,087	68,037	80,309
Sprayers and Dusters	168,679	161,709	158,848	155,752	139,287
Farm Elevators and Blowers	148,002	114,691	87,611	100,404	91,952
Cultivators and Weeders	189,439	140,079	224,013	227,440	162,786
Machines for Preparing Crops for Market or Use	356,311	308,932	233,656	262,379	254,921
Farm Poultry Equipment	148,465	127,867	100,472	70,023	76,154
Hog Equipment	76,310	54,481	59,793	37,574	45,480
Other Barn and Barnyard Equipment	219,171	188,150	160,580	137,250	167,521
Garden Tractors, Motor Tillers	686,375	574,702	586,278	553,269	561,250
Farm Wagons, Other Farm Transportation Equipment (1)	203,212	183,934	173,130	178,577	186,204
TOTALS	**5,766,280**	**5,277,236**	**5,066,854**	**4,732,150**	**4,198,453**

Source: U.S. Dept. of Commerce, Bureau of the Census, Current Industrial Reports, Farm Machinery and Equipment (MA-35A).

II—Wheel Tractors and Attachments

	1978	1977	1976	1975	1974
Wheel Tractors, Farm Type	2,262,291	2,424,139	2,235,111	2,099,501	1,509,806
Wheel Tractors, Non-Farm (2)	132,451	115,458	93,876	118,531	160,688
Attachments for Wheel Tractors, Farm and Non-Farm	NA	34,780	37,472	35,040	35,937
Parts for Wheel Tractors, Farm and Non-Farm	NA	420,273	279,637	222,575	238,970
TOTALS		**2,994,650**	**2,646,096**	**2,475,647**	**1,945,401**

(1) Data for 1976, 1977 and 1978 include operator cabs in attachments and parts for these items.

(2) Industrial Type, excluding tractor chassis, shipped as a part of front engine mount, integral design tractor shovel loader/backhoes.

Source: U.S. Dept. of Commerce, Bureau of the Census, Current Industrial Reports, Tractors, Except Garden Tractors (M35S).

NA—Not available or not applicable.

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Shipments of Farm Machines and Equipment
(In units, 1974-1978)

Type of Farm Equipment	1978	1977	1976	1975	1974
Balers, Hay, All Types:					
Bales Under 200 lbs.	22,659	24,876	26,054	27,718	35,133
Bales Over 200 lbs.	21,303	17,745	24,097	21,400	6,757
Blowers (includes forage type, combination grain-forage type)	13,159	10,348	9,826	10,082	13,507
Cabs (Metal), Farm Tractor	11,215	6,766	12,216	11,734	17,150
Cabs, Other Equipment	8,759	9,025			
Cleaners, Barn (gutter cleaners for stanchion barns)	10,239	9,445	9,185	9,563	12,268
Combines, Grain, Pull Type and Self-Propelled	31,843	31,943	31,712	31,259	28,644
Combines, Peanut	1,572	1,790	1,919	2,647	2,131
Combine Attachments:					
Corn Heads	18,629	24,035	25,087	26,741	29,228
Corn Pickers	(1)	(1)	4,404	4,536	6,390
Cotton Strippers (all types)	1,900	1,816	1,127	1,361	2,612
Cultivators, Corn and Cotton Types (2)	31,782	33,999	40,299	48,404	41,450
Cultivators, Field:					
Pull Type	12,352	17,470	22,703	21,709	18,923
Mounted	4,417	8,992	9,239	8,469	6,692

In some cases I&T has combined data because of space limitations. If you need more information from MA-35A, write us.
DATA: Current Industrial Reports, Series MA-35S, Bureau of the Census.
(1) Data combined under Harvesting Machinery, Other.
(2) Rear-mounted only; data for front-mounted machines are combined under Cultivators and Weeders, Other.

(More...)

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Circle (41) on Reply Card

Shipments of Farm Machines and Equipment

(in units, 1974-1978)

Type of Farm Equipment	1978	1977	1976	1975	1974
Cultivators, Rotary:					
Ground Driven, Sections and Machines (3)	14,197	16,219	.....	.....	.....
Ground Driven, Integrally Mounted	7,574	8,637	12,034	17,136	17,974
Power Driven	628	672	1,186	9,513	8,058
Cultivators and Weeders, Other	42,148	46,372	30,659	20,296	.....
Curers, Tobacco	2,571	4,315	10,459	14,839	12,245
Cutters and Shredders or Rotary Mowers (pto):					
Flail Type	9,266	12,409	12,096	11,359	14,954
Horizontal Blade Type	69,677	79,953	74,562	76,412	117,865
Dairy Cattle Chain Tie Stalls	56,873	49,039	47,026	32,885	54,253
Dairy Cattle Milking Parlor Stalls	23,169	17,854	19,606	14,840	33,215
Dairy Cattle Stanchions, Swing Type	134,568	83,331	64,093	52,033	93,180
Dairy Cattle Stalls for use with stanchions	42,141	32,877	36,732	22,244	37,554
Diggers, Peanut (shakers and windrowers but not including combines)	2,002	2,517	1,706	2,207	2,418
Distributors (Fertilizer):					
Dry	10,896	11,446	13,310	12,306	16,221
Liquid	7,230	6,619	5,635	4,997	6,456
Anhydrous Ammonia	6,294	6,562	8,458	5,233	4,187

In some cases I&T has combined data because of space limitations. If you need more information from MA-35A, write us.

DATA: Current Industrial Reports, Series MA-35S, Bureau of the Census.

(3) Includes data for integrally mounted machines, under 4-row.

(*More...*)

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Circle (44) on Reply Card

Shipments of Farm Machines and Equipment
(in units, 1974-1978)

Type of Farm Equipment	1978	1977	1976	1975	1974
Dryers, Grain, Hay and Seed Batch Type pto or Electric-Motor Operated	11,760	10,373	6,525	6,268	7,343
Continuous Flow Type	2,281	4,362	2,446	2,529	3,981
Heated Air Units	25,311	26,692	20,933	22,011	23,457
Dusters, Power, All Types	574	875	2,095	2,152	1,707
Elevators, Portable:					
Single Chain	6,100	5,004	5,625	7,196	16,092
Double Chain	8,612	7,174	5,504	10,794	15,372
Auger Type, Under 6 in. dia.	42,504	40,668	28,260	29,684	49,426
Auger Type, 6 in. dia.	79,401	73,628	53,425	55,207	84,302
Auger Type, Over 6 in. dia.	74,884	58,382	51,232	50,016	46,744
Elevators, Stationary and Other	11,442	10,270	5,439	7,329	9,994
Fans, Crop Drying and Aeration	46,451	45,668	24,997	19,586	15,936
Feeders, Bunk, Electric Powered	13,647	11,394	11,770	11,742	16,116
Grain Heads for Combines	48,105	45,892	47,991	62,049	64,837
Grinder-Mixers, Stationary and Portable	16,648	12,393	13,621	15,227	24,202
Harrows, Disk	80,829	96,650	111,009	120,904	112,657
Harrow Sections (Spike-, Spring- and Tine-Tooth)	96,223	103,260	156,562	199,166	159,511
Harvesters, Beet	312	556	1,278	1,016	1,141
Harvesters, Forage, Field, Shear-bar Type, Self-Propelled and Pull	13,003	14,573	16,402	16,036	20,307

(More...)

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Shipments of Farm Machines and Equipment
(In units, 1974-1978)

Type of Farm Equipment	1978	1977	1976	1975	1974
Attachments for Shear-bar Type, Pickup and Cutter-bar Hay Units	10,980	9,126	11,428	13,857	17,496
Row Crop Units, all sizes	13,539	14,687	16,356	15,101	19,757
Flail Type, Including Discharge Spouts	3,972	4,167	6,225	6,756	4,997
Harvesters, Potato	1,312	1,005	1,328	1,273	1,183
Harvesting Machinery, Other	12,130	11,801	7,497	7,500	.....
Levelers or Scrapers	160,565	99,287	78,693	82,958	106,742
Loaders, Field, for Baled Hay	5,142	4,136	5,770	5,125	1,827
Loaders, Tractor Mounted, Farm Type, for Manure and General Utility	42,812	27,661	25,846	28,045	40,845
Mills, Feed, Farm Size (Includes Grinders and Crushers of the Hammer, Burr or Roller Types)	8,838	6,508	4,871	9,080	7,386
Mixers, Feed, Farm Size	3,924	2,885	1,802	1,415	1,449
Mowers, Cutter Bar Type (See Cutters for Rotary Type)	12,134	13,962	14,195	25,157	24,396
Mower-Conditioners, Self-Propelled and Pull-Type	29,921	27,517	32,940	35,539	37,258
Planters, Corn and Cotton, All Types	NA	183,089	139,841	92,416	52,545

In some cases I&T has combined data because of space limitations. If you need more information from MA-35A, write us.
DATA: Current Industrial Reports, Series MA-35S, Bureau of the Census.
NA—Not available or not applicable.

(More...)

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Shipments of Farm Machines and Equipment

(in units, 1974-1978)

Type of Farm Equipment	1978	1977	1976	1975	1974
Planters, Row Crop Units (quantity in number of rows)	34,762	41,424	83,004	84,387	60,594
Plows, Disk, 1-way, 2-way	184	278	317	357	1,066
Plows, Chisel or Sweep Type:					
Pull-Type	12,090	15,084	21,505	19,351	15,526
Mounted	10,501	15,194	16,694	16,547	13,940
Plows, Terracing and Ditching	2,039	2,261	2,938	2,536	2,752
Plows, Moldboard:					
Pull-Type, 1-way	2,516	4,438	6,938	5,833	3,355
Mounted, 1-way	11,852	15,771	16,513	17,565	24,802
Semi-Mounted, 1-way	14,099	22,294	23,841	27,283	26,734
Pull-Type and Mounted, 2-way	3,473	3,822	5,369	5,978	5,652
Plows, One-Way Diskers	(4)	539	1,556	1,767	2,742
Plows, Subsoilers (deep tillage)	4,794	8,129	5,527	5,143	3,800
Plows, Other (except snow)	2,891	1,795	1,646	1,248	1,223
Rakes, Hay, Side-Delivery, Cylinder and Finger Wheel Types	20,620	20,328	21,896	22,591	21,010
Rollers and Harrow Mulchers	8,384	8,619	10,018	10,453	13,091
Silo Unloaders, Tower Type	26,328	25,899	21,556	20,288	27,822
Sprayers, Field and Row Crop Type:					
Power, Self-Propelled	3,103	2,941	3,686	4,583	5,273
Power, Tractor-Mounted	21,230	17,228	15,340	19,539	25,853
Power, Non-Tractor-Mounted	13,542	13,498	15,151	17,965	25,542

In some cases I&T has combined data because of space limitations. If you need more information from MA-35A, write us.
DATA: Current Industrial Reports. Series MA-35A and M-35S, Bureau of the Census.
(4) Data combined under Plows, Other.

(More...)

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Shipments of Farm Machines and Equipment

(in units, 1974-1978)

Type of Farm Equipment	1978	1977	1976	1975	1974
Sprayers, Air-Carried, Power (Field, Row-Crop, Orchard):					
Complete Units	7,353	7,662	7,740	8,694	8,659
Attachment Type			84	153	39
Sprayer Pumps	61,120	49,086	33,547	33,052	38,333
Spreaders, Manure:					
Conveyor Type	16,237	16,688	18,065	19,996	24,248
Tank Type	7,584	7,853	8,174	9,981	13,756
Stackers, Hay	1,422	1,037	4,517	8,972	10,796
Tillers, Motor, Garden Type	556,586	536,394	418,541	844,578	749,449
Tool Bars, Basic Units, Pull or Mounted	6,975	8,639	7,183	7,657	15,230
Tractors, Garden, Riding Type:					
Under 10 hp	61,257	72,909	61,509	40,615	138,705
10 hp and over	301,024	258,789	258,419	188,489	247,675
Tractors, Garden, Walking Type	NA	115,214	120,258	136,296	151,197
Tractors, Tracklaying Type:					
20 to 89 net engine hp	7,862	7,208	18,972	20,453	23,623
90 to 159 net engine hp	14,211	5,044			
Over 159 net engine hp		7,716			
Tractors, Wheel Type:					
Farm Type	136,240	168,888	175,977	187,117	178,478
Non-Farm Type	39,809	17,623	17,747	24,199	33,845
Transplanters, Pull-Type or Mounted, and Broadcast Seeders	27,296	30,250	29,400	25,558	31,240
Wagons, Farm Type (chassis only) and trailer gear	51,912	57,831	59,336	93,570	116,601
Wagon Boxes and Racks for mounting on wagons and trailer gear:					
Manual Unloading or Dump	21,386	16,437	17,202	18,753	23,486
Gravity Unloading (grain type)	31,072	28,714	32,470	41,350	51,773
Power Unloading	18,064	19,135	20,825	22,480	32,641
Wagon Boxes with Integral Running Gear	6,747	6,097	6,107	7,407	6,264
Windrowers or Swathers, Grain Harvesting, Draper Type	617	601	1,225	1,218	757
Windrowers, Haying, Self-Propelled with Conditioner	4,098	6,003	7,386	8,539	7,254

In some cases I&T has combined data because of space limitations. If you need more information from MA-35A, write us.
DATA: Current Industrial Reports, Series MA-35A and M-35S, Bureau of the Census.

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Circle (55) on Reply Card

PRODUCTION OF WHEEL TRACTORS (in units)

By Type of Fuel Used (except garden and contractors' off-highway types)

Year	Gasoline	Diesel	LPG	Total
1955	277,105	41,506	11,530	330,141
1956	177,077	26,762	10,815	214,654
1957	179,142	37,352	12,556	229,050
1958	173,040	55,864	12,365	241,269
1959	167,961	79,548	12,407	259,916
1960	84,306	62,033	5,848	152,187
1961	84,102	80,920	6,395	171,417
1962	99,414	80,293	8,394	188,101
1963	96,108	98,609	8,732	203,449
1964	90,004	115,439	7,778	213,221
1965	98,970	138,247	6,833	244,050
1966	107,683	157,352	5,652	270,687
1967	80,630	158,741	2,844	242,215
1968	61,978	147,744	3,477	213,199
1969	59,111	135,118	1,475	195,704
1970	48,981	122,622	(D)	171,603*
1971	40,642	126,859	(D)	167,501*
1972	42,389	154,827	(D)	197,216*
1973	37,860	173,646	(1)	211,506
1974	33,860	176,214	(2)	210,074
1975	27,429	183,484	(2)	210,913
1976	16,690	177,034	(2)	193,724
1977	9,603	175,805	(2)	185,408

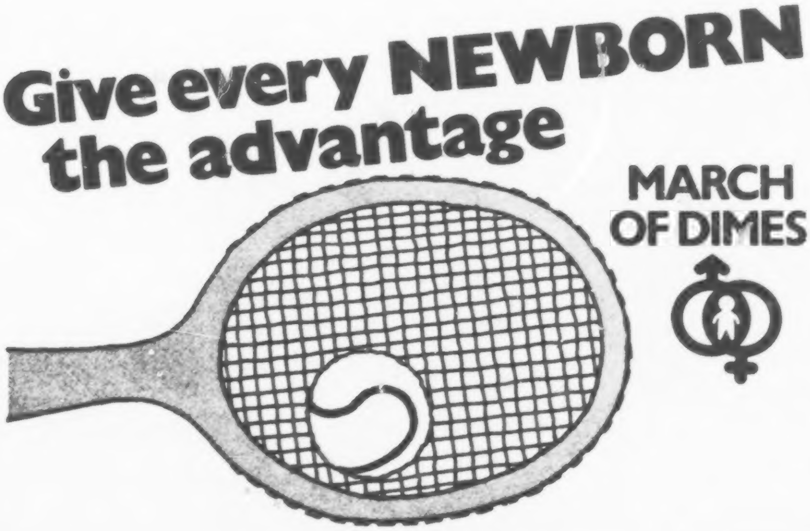
(D)—Withheld to avoid disclosing the operations of individual companies.

*Production totals exclude LPG powered tractors which amount to less than 1% of wheel tractors produced.

(1)—For 1973, gasoline and LPG powered tractors 90 horsepower and over have been included with diesel tractors to avoid disclosure of individual company data. These tractors amount to less than 1% of wheel tractors produced.

(2)—Since 1974, LPG and gasoline fuel type tractors are combined.

Data: Current Industrial Reports, Series M35S, Bureau of the Census.



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Circle (58) on Reply Card

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CPR—cardiopulmonary resuscitation training is one of the valuable assets an employee can have.

If even one employee has this training, (which is available from Red Cross), every other co-worker benefits. Everybody can breathe easier knowing that in the event of a cardiac arrest, help is immediately available.

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PRODUCTION OF TRACTORS (in units)

Year	Wheel-type & Tracklaying	Wheel-type	Tracklaying	Garden Tractors† & Motor Tillers
1925-29 Avg.	185,727	172,179	14,091	4,665
1936-39 Avg.	222,161	197,445	24,716	9,095
1940-44 Avg.	249,336	217,874	31,463	12,987
1945-49 Avg.	442,648	404,230	38,419	126,121
1950	542,448	498,768	43,680	151,198
1951	617,060	567,446	49,614	177,169
1952	463,211	414,560	48,651	199,321
1953	442,247	390,385	51,862	245,609
1954*	285,159	245,755	39,404	191,235
1955	377,114	330,141	46,973	185,696
1956	272,265	214,654	57,611	200,997
1957	265,852	229,050	36,802	178,542
1958	265,495	241,269	24,226	227,073
1959	297,078	259,916	37,162	327,083
1960	178,500	152,187	26,313	416,455
1961	191,191	171,417	19,774	389,861
1962	207,281	188,101	19,180	421,833
1963	224,306	203,449	20,857	347,413
1964	240,579	213,221	27,358	416,486
1965	271,751	244,050	27,701	422,342
1966	299,114	270,687	28,427	507,606
1967	262,061	242,215	19,846	560,387
1968	236,023	213,199	22,824	583,265
1969	218,547	195,704	22,843	529,746
1970	191,679	171,603	20,076	498,372
1971	186,249	167,501	18,748	491,117
1972	218,213	196,988	21,225	662,583
1973	236,944	212,072	24,872	847,427
1974	233,825	210,074	23,751	1,287,026
1975	231,968	210,913	21,055	1,209,978
1976	213,154	193,724	19,430	858,727
1977	205,285	185,408	19,877	874,354
1978	196,860	174,659	22,201	918,866**

*Figures subsequent to 1954 exclude contractors' off-highway wheel type.

†Figures represent manufacturers' shipments subsequent to 1957. Production not available on comparable basis.

**Excludes walking-type tractors.

Data: Current Industrial Reports: Series M35S and M35A, Bureau of the Census.

NEW DRY EDIBLE BEAN COMBINE HARVESTER

Light, low cost, drawn combine harvester with axial-flow threshing drum for delicate seed handling. High capacity, low power requirements. Simple and purposeful design ensures low operating and maintenance cost. Low friction pick-up. Optional chaff blower to have overflow of threshing drum available as high quality fodder.

Prospective importers are invited to supply relevant information to:

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Circle (59) on Reply Card

CrustBuster
FARM EQUIPMENT

Positive Depth Soybean Drills plant like planters, save money for farmers and make money for Dealers.

Our pair of doubles beats every drill on the market:

Double-disc openers, followed by double firming wheels, are individually mounted as a pair, with a positive depth stop.

With beans planted at ideal depth for field and moisture conditions, firming wheels leave a center crown of soft soil over them. Double firming wheels press along each side of the seed, leaving faint tracks which channel the puddling of rainwater to the sides. Resulting crust is then heaviest beside – not over – the emerging plants.

New, improved CrustBuster front wheel drive. Patented wobble slot feeds gently, meters and spaces beans more evenly for a uniform stand – solid or rowed.

Three-point, or pull-type models that fold by hydraulics for towing on their own wheels at normal road speeds and even back into sheds without any nonsense.

Farmers learn fast that CrustBuster farm equipment saves time and money: Grain Drills • Offset Discs • Field Cultivators • Chisel Plows • and the original Springtooth-Cultivator that gave us our name. Each line starts with standard widths, but stretches section by section to the widest in the field, folding for towing.

Dealers who take on the affordable portables know them as the profit line. Call (316) 385-2651 or write CrustBuster, Inc., Box 337, Spearville, KS 67876.

CrustBuster
AFFORDABLE PORTABLES PUT
MORE PROFITS
IN YOUR POCKET!
® CrustBuster, Inc.

Circle (61) on Reply Card

State	40-49	50-59	60-69	70-79	80-89	90-99	100-119
Alabama	689	302	289	145	332	61	316
Arizona	68	26	61	32	60	52	109
Arkansas	780	297	230	73	123	22	158
California	555	625	902	446	467	100	387
Colorado	99	55	69	15	67	17	101
Connecticut	61	40	32	9	18	2	21
Delaware	15	21	31	6	25	5	23
Florida	439	279	502	312	299	28	184
Georgia	860	342	386	283	360	65	395
Idaho	73	95	123	39	145	40	166
Illinois	312	342	460	344	496	121	1,003
Indiana	332	390	485	237	438	64	667
Iowa	121	222	538	333	684	234	1,598
Kansas	109	116	143	77	188	109	549
Kentucky	1,304	974	779	339	464	79	225
Louisiana	488	184	219	96	101	33	134
Maine	65	44	37	13	29	3	36
Maryland	160	104	134	48	72	25	89
Massachusetts	41	36	21	6	15	2	6
Michigan	340	413	456	196	346	88	415
Minnesota	161	274	543	322	625	207	1,307
Mississippi	619	274	278	118	228	46	279
Missouri	667	551	544	261	484	123	592
Montana	39	73	89	40	87	33	130
Nebraska	51	57	115	76	232	137	818
Nevada	3	7	10	4	14	4	15
N. Hampshire	51	39	23	6	11	4	10
New Jersey	83	52	51	14	50	5	41
New Mexico	76	41	35	29	18	5	35
New York	324	433	565	234	401	84	382
North Carolina	1,190	602	598	361	587	74	405
North Dakota	25	39	74	37	72	53	408
Ohio	682	699	760	320	616	130	712
Oklahoma	486	195	220	82	197	105	372
Oregon	314	266	174	50	122	36	131
Pennsylvania	441	464	553	150	413	88	338
Rhode Island	9	4	5	.....	2	3	3
South Carolina	476	214	203	164	195	17	134
South Dakota	24	50	128	58	196	103	602
Tennessee	1,148	658	512	260	432	55	338
Texas	1,727	811	721	389	548	153	799
Utah	94	103	111	26	63	19	93
Vermont	47	89	74	37	58	9	35
Virginia	801	385	370	141	295	44	209
Washington	479	416	184	45	102	32	92
West Virginia	300	150	79	18	24	2	15
Wisconsin	220	552	954	423	843	206	947
Wyoming	21	29	37	24	42	12	60
Alaska	4	3	3	7	1	2	.....
Hawaii	32	17	7	6	4	1	2
US Government	2	4	14	5	.....	5	8
Miscellaneous	11	.....	10	9	3	10	16
TOTAL	**17,521**	**12,458**	**13,941**	**6,765**	**11,694**	**2,957**	**15,910**

1978 Retail Sales of Farm Wheel Tractors by PTO Horsepower and State (in units)

Two-Wheel-Drive Tractors							Four-Wheel-Drive Tractors						
120-129	130-139	140-149	150-159	160-179	180 & over	Total 2-Wheel Drive	Under 170	170-199	200-249	250 & over	Total 4-Wheel Drive	All Farm Wheel Tractors	State
42	345	75	99	45	67	2,807	.....	9	39	14	62	2,869	Alabama
22	106	19	65	25	41	686	1	13	41	14	69	755	Arizona
73	547	248	465	189	396	3,601	7	51	181	65	304	3,905	Arkansas
54	414	55	140	99	107	4,351	8	90	178	57	333	4,684	California
46	241	49	104	20	64	947	10	24	45	10	89	1,036	Colorado
1	14	1	1	.....	.....	200	.....	3	.....	.....	3	203	Connecticut
11	23	4	4	3	4	175	.....	5	7	2	14	189	Delaware
26	155	39	23	21	32	2,339	3	64	21	9	97	2,436	Florida
112	753	132	191	76	166	4,121	1	12	37	7	57	4,178	Georgia
51	222	70	93	21	20	1,158	13	43	68	21	145	1,303	Idaho
276	2,084	563	745	461	567	7,774	40	270	349	154	813	8,587	Illinois
159	1,126	267	385	271	248	5,069	35	146	209	81	471	5,540	Indiana
343	2,922	715	714	383	380	9,187	23	153	240	76	492	9,679	Iowa
175	1,008	150	432	136	299	3,491	29	166	238	55	488	3,979	Kansas
42	282	51	84	46	78	4,747	4	26	53	21	104	4,851	Kentucky
44	317	203	343	115	323	2,600	1	48	151	46	246	2,846	Louisiana
4	10	2	.....	.....	1	244	.....	1	.....	.....	1	245	Maine
21	84	14	13	19	8	791	1	9	9	3	22	813	Maryland
.....	1	.....	1	.....	.....	129	.....	.....	.....	.....	.....	129	Massachusetts
102	502	87	105	54	58	3,162	50	91	78	31	250	3,412	Michigan
258	1,770	348	355	223	167	6,560	32	258	211	78	579	7,139	Minnesota
67	582	161	473	172	329	3,626	2	44	112	57	215	3,841	Mississippi
180	894	223	297	152	204	5,172	14	66	117	54	251	5,423	Missouri
34	152	25	62	26	35	825	62	122	180	63	427	1,252	Montana
169	1,338	358	406	139	181	4,077	8	83	90	24	205	4,282	Nebraska
2	7	5	2	.....	3	79	.....	1	2	.....	3	82	Nevada
.....	5	1	.....	.....	.....	150	.....	.....	.....	.....	.....	150	N. Hampshire
3	40	8	4	7	1	359	2	2	2	.....	6	365	New Jersey
11	81	10	40	5	10	396	2	9	10	3	24	420	New Mexico
40	254	41	39	20	8	2,[illegible]	16	53	24	12	105	2,930	New York
67	333	83	102	44	87	4,533	1	17	26	7	51	4,584	North Carolina
140	889	192	309	145	160	2,543	99	317	366	76	858	3,401	North Dakota
163	942	199	241	135	145	5,744	21	137	155	40	353	6,097	Ohio
91	605	53	191	43	108	2,748	11	96	120	28	255	3,003	Oklahoma
15	126	22	51	16	13	1,336	10	42	29	6	87	1,423	Oregon
46	199	24	29	19	17	2,781	10	13	6	2	31	2,812	Pennsylvania
.....	.....	.....	.....	.....	.....	26	.....	.....	.....	.....	.....	26	Rhode Island
45	205	56	61	34	67	1,871	.....	6	20	7	33	1,904	South Carolina
103	779	135	203	76	61	2,518	39	103	109	23	274	2,792	South Dakota
77	521	120	181	87	169	4,558	1	20	39	31	91	4,649	Tennessee
200	1,763	434	584	247	378	8,754	13	98	222	82	415	9,169	Texas
9	71	14	10	3	3	619	1	7	6	2	16	635	Utah
6	24	4	.....	3	.....	386	4	.....	.....	.....	4	390	Vermont
31	184	27	34	16	31	2,568	1	2	5	2	10	2,578	Virginia
16	117	14	59	7	14	1,577	16	63	87	28	194	1,771	Washington
1	7	1	1	.....	.....	598	.....	.....	.....	.....	.....	598	West Virginia
208	706	138	140	62	74	5,473	13	74	50	23	160	5,633	Wisconsin
11	69	19	16	8	9	357	3	11	6	5	25	382	Wyoming
.....	.....	.....	.....	.....	.....	20	.....	.....	.....	.....	.....	20	Alaska
.....	1	.....	.....	.....	.....	70	.....	1	3	2	6	76	Hawaii
.....	7	.....	2	.....	1	48	.....	3	.....	.....	3	51	US Government
1	14	.....	4	.....	9	87	.....	.....	3	.....	3	90	Miscellaneous
3,598	**23,841**	**5,459**	**7,903**	**3,673**	**5,143**	**130,863**	**607**	**2,872**	**3,944**	**1,321**	**8,744**	**139,607**	**TOTAL**

DATA: Farm & Industrial Equipment institute. Figures do not include garden tractors, motor tillers, or contractor's off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; International Harvester; Long; Massey-Ferguson; Steiger; Versatile; White; and Woods & Copeland. Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-Dec., 1977 and 1978 (1)

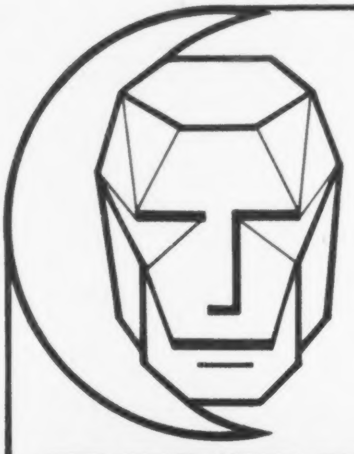
(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled Power Units		Windrowers Self-Propelled Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1977	1978	1977	1978	1977	1978	1977	1978	1977	1978	1977	1978	1977	1978
Alabama	428	539	158	161	454	378	1	1	1	1	227	220	55	64
Arizona	55	47	5	10	58	36	78	77	88	82	3	7	10	10
Arkansas	999	1,045	6	6	614	524	4	2	4	1	86	65	26	21
California	207	253	67	75	275	210	402	302	415	322	9	6	105	84
Colorado	251	249	157	132	386	422	238	257	240	257	42	54	132	162
Connecticut	.....	1	.....	2	69	76	.....	1	.....	1	1	1	54	40
Delaware	58	50	53	40	16	34	.....	3	.....	3	4	7	15	14
Florida	102	165	85	93	219	140	1	.....	1	.....	51	69	45	34
Georgia	564	725	508	575	406	365	1	5	1	5	408	520	109	139
Idaho	349	360	19	15	527	530	353	302	357	311	52	30	57	64
Illinois	3,452	3,600	3,630	3,549	461	414	38	30	38	30	640	748	476	354
Indiana	1,959	2,048	2,111	2,075	555	498	7	17	8	17	488	599	344	281
Iowa	2,912	3,665	3,254	3,866	530	486	283	265	287	272	1,350	1,893	1,117	954
Kansas	1,595	1,605	487	384	584	448	401	359	401	367	224	314	328	283
Kentucky	559	508	468	411	748	669	3	5	3	5	284	302	288	258
Louisiana	622	657	12	8	248	184	.....	1	.....	1	20	15	20	24
Maine	15	8	4	.....	104	94	.....	.....	.....	.....	4	.....	60	36
Maryland	184	171	204	175	159	169	7	12	7	13	56	46	102	88
Massachusetts	1	.....	2	1	55	61	1	1	1	1	1	4	38	32
Michigan	506	562	509	532	526	583	69	72	69	72	244	270	522	466
Minnesota	1,741	2,110	1,511	1,813	1,188	1,111	1,175	859	1,217	888	631	725	1,178	1,096
Mississippi	798	806	30	20	377	262	1	.....	1	.....	65	76	69	71
Missouri	1,459	1,575	909	868	830	751	108	92	108	96	479	583	257	205
Montana	363	456	1	1	361	464	428	569	458	624	90	65	61	68
Nebraska	1,400	1,738	1,365	1,605	329	278	543	457	552	474	364	522	444	428
Nevada	9	7	.....	.....	59	52	54	66	57	71	1	1	9	7
New Hampshire	.....	.....	.....	.....	52	55	2	1	2	1	1	.....	31	29
New Jersey	75	68	38	32	67	78	1	3	1	3	20	12	36	38
New Mexico	44	21	17	9	204	187	107	98	108	97	13	13	18	9
New York	154	171	194	204	726	882	61	83	59	85	170	174	1,465	913
North Carolina	594	591	617	544	458	569	2	2	2	2	204	252	133	143
North Dakota	860	1,182	68	67	187	145	992	1,063	1,042	1,130	136	124	132	144
Ohio	1,625	1,655	1,471	1,450	898	904	20	17	20	17	496	498	430	356
Oklahoma	503	461	55	22	834	743	152	152	151	155	138	141	48	39
Oregon	267	248	8	15	439	389	351	348	357	365	13	25	90	95
Pennsylvania	307	272	352	303	954	1,141	65	88	63	87	426	323	823	689
Rhode Island	.....	.....	.....	.....	7	6	.....	.....	.....	.....	1	.....	3	7
South Carolina	350	355	256	199	165	178	1	.....	1	.....	97	120	30	41
South Dakota	620	712	369	497	303	272	933	821	971	863	247	340	603	415
Tennessee	658	686	294	254	835	804	5	2	5	2	291	281	242	227
Texas	1,102	897	478	276	1,234	1,369	133	98	136	104	212	231	88	60
Utah	44	49	7	13	344	339	146	156	147	159	69	70	78	94
Vermont	.....	.....	.....	2	112	132	2	2	2	2	4	2	186	131
Virginia	206	216	226	181	468	610	11	9	11	9	133	145	231	263
Washington	269	328	49	24	449	367	230	187	244	191	8	29	163	130
West Virginia	5	4	3	5	307	373	.....	.....	.....	.....	22	32	56	56
Wisconsin	494	575	578	669	2,086	2,069	308	377	310	381	464	570	2,301	2,303
Wyoming	49	52	14	13	157	229	154	188	149	196	10	18	31	36
Alaska	1	.....	.....	.....	4	6	1	.....	1	.....	.....	.....	.....	1
Hawaii	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	.....	1
U.S. Government	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	5	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	.....
TOTAL	**28,821**	**31,494**	**20,551**	**21,196**	**21,429**	**21,086**	**7,873**	**7,450**	**8,096**	**7,763**	**8,999**	**10,544**	**13,146**	**11,523**

Data released Feb. 21, 1979, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types		Manure Spreaders Conveyor-Type		
1977	1978	1977	1978	
255	264	14	20	........Alabama
8	4	8	9	.........Arizona
482	520	96	101	........Arkansas
71	54	59	69	........California
115	125	32	42	........Colorado
67	93	69	86	.....Connecticut
19	31	72	64	........Delaware
176	141	28	28	..........Florida
293	340	48	36	.........Georgia
145	135	94	144	...........Idaho
834	782	947	1,128	..........Illinois
736	728	682	766	..........Indiana
1,350	1,501	1,754	2,409	............Iowa
744	715	141	219	..........Kansas
1,090	1,235	252	303	........Kentucky
142	118	21	21	........Louisiana
104	115	104	116	...........Maine
157	174	228	242	........Maryland
77	86	60	67	...Massachusetts
740	949	646	828	........Michigan
1,253	1,309	1,481	1,849	.......Minnesota
206	202	22	28	......Mississippi
1,437	1,627	273	384	........Missouri
98	137	54	64	........Montana
472	462	254	442	........Nebraska
10	3	4	7	..........Nevada
57	83	55	62	..New Hampshire
83	97	63	58	......New Jersey
32	38	14	3	.....New Mexico
1,076	1,258	1,619	1,732	........New York
360	489	149	171	...North Carolina
86	131	150	190	....North Dakota
1,114	1,284	1,067	1,028	............Ohio
609	705	44	29	........Oklahoma
277	251	77	107	..........Oregon
1,136	1,329	1,407	1,367	.....Pennsylvania
7	6	.....	3	....Rhode Island
151	174	25	32	...South Carolina
100	122	287	305	....South Dakota
669	866	152	162	.......Tennessee
1,067	1,367	133	136	...........Texas
193	191	86	157	............Utah
204	248	231	261	.........Vermont
482	676	202	247	.........Virginia
198	204	68	122	......Washington
159	228	93	88	....West Virginia
2,949	3,208	2,565	3,132	.......Wisconsin
30	151	29	47	........Wyoming
1	1	.....	1	..........Alaska
1	.....	.....	.....	..........Hawaii
.....	.....	.....	.....	.U.S. Government
.....	.....	3	1	...Miscellaneous
22,122	**24,957**	**15,962**	**18,913**	........**TOTAL**



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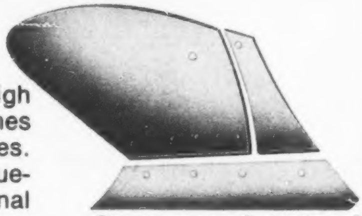

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Motor Vehicles and Specified Machines on U.S. Farms and Average Prices of Wheel Tractors, Designated Years[1]

Year	Tractors (exclusive of steam & garden)[2] Thousands	Motor Trucks Thousands	Grain Combines Thousands	Corn Pickers and Picker Shellers Thousands	Pick-up Balers Thousands	Field Forage Harvesters Thousands	Garden Tractors and Motor Tillers[3] Thousands	Wheel Tractors Wholesale Prices[4]	
								Per Unit Dollars	Horsepower Dollars
1922	372	263	.....	.....	.....	.....	.....	.....	.....
1923	428	316	.....	.....	.....	.....	.....	.....	.....
1924	496	363	.....	.....	.....	.....	.....	.....	.....
1925	549	459	.....	.....	.....	.....	.....	.....	.....
1926	621	559	.....	.....	.....	.....	.....	.....	.....
1927	693	662	.....	.....	.....	.....	.....	.....	.....
1928	782	753	.....	.....	.....	.....	.....	.....	.....
1929	827	840	.....	.....	.....	.....	.....	.....	.....
1930	920	900	61	50	.....	.....	.....	.....	.....
1931	997	920	.....	.....	.....	.....	.....	.....	.....
1932	1,022	910	.....	.....	.....	.....	.....	.....	.....
1933	1,019	865	.....	.....	.....	.....	.....	.....	.....
1934	1,016	875	.....	.....	.....	.....	.....	.....	.....
1935	1,048	890	.....	.....	.....	.....	.....	.....	.....
1936	1,125	923	.....	.....	.....	.....	.....	.....	.....
1937	1,230	990	.....	.....	.....	.....	.....	.....	.....
1938	1,370	1,042	.....	.....	.....	.....	.....	.....	.....
1939	1,445	1,020	.....	.....	.....	.....	.....	.....	.....
1940	1,545	1,047	190	110	.....	.....	.....	.....	.....
1941	1,675	1,095	225	120	.....	.....	.....	.....	.....
1942	1,885	1,160	275	130	[illegible]	.....	.....	.....	.....
1943	2,100	1,280	320	138	[illegible]	.....	.....	$ 579	$21
1944	2,215	1,385	345	146	34	.....	.....	$ 658	$24
1945	2,354	1,490	275	168	42	20	68	$ 665	$25
1946	2,480	1,550	420	203	54	25	80	$ 733	$28
1947	2,613	1,700	465	236	65	30	122	$ 783	$30
1948	2,821	1,900	535	299	90	45	159	$ 890	$33
1949	3,123	2,065	620	372	135	60	192	$ 994	$35
1950	3,399	2,209	714	456	196	81	216	$1,073	$37
1951	3,678	2,310	810	522	240	102	242	$1,234	$42
1952	3,907	2,410	887	588	298	124	268	$1,297	$42
1953	4,100	2,520	930	630	345	148	296	$1,359	$39
1954	4,243	2,610	965	660	395	175	315	$1,513	$39
1955	4,345	2,675	980	688	448	202	332	$1,554	$39
1956	4,480	2,707	1,005	715	505	220	353	$1,682	$41
1957	4,570	2,745	1,015	740	560	240	375	$1,842	$41
1958	4,620	2,775	1,030	755	600	258	400	$2,111	$46
1959	4,673	2,800	1,045	775	645	270	425	$2,189	$48
1960	4,688	2,834	1,042	792	680	291	450	$2,338	$49
1961	4,743	2,850	980	740	685	291	468	$2,578	$50
1962	4,763	2,885	960	730	703	300	485	$2,819	$51
1963	4,778	2,925	940	720	718	307	500	$3,046	$53
1964	4,786	2,970	920	705	734	312	513	$3,443	$53
1965	4,787	3,030	910	690	751	316	699	$3,541	$56
1966	4,783	3,017	888	686	752	316	725	$3,886	$58
1967	4,786	3,009	867	680	748	319	750	$4,257	$62
1968	4,766	3,016	847	673	739	321	770	$4,709	$66
1969	4,712	3,004	820	657	725	314	790	$4,976	$71
1970	4,619	2,978	790	635	708	304	805	$5,560	$76
1971	4,562	2,985	760	629	698	309	815	$6,190	$80
1972	4,509	2,993	725	625	687	315	825	$6,486	$84
1973	4,477	3,006	703	618	680	324	835	$6,953	$85
1974	4,478	3,020	685	618	677	332	850	$7,294	$86
1975	4,463	3,032	666	615	666	337	870	$8,459	$91
1976	4,434	3,043	647	610	642	342	890	$11,220	$112
1977	4,381	3,052	630	605	614	346	905	$12,692	$124
1978	4,350	3,054	615	600	595	345	917	$14,273	$132
1979	4,312	3,057	600	590	575	342	930	$16,617	$150

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[1] SOURCE: Reports of the USDA and the Bureau of the Census. After 1959 Alaska and Hawaii are included. On-farm data after 1970, except for 1974, are estimated by I&T.

[2] Consists of Wheel and Crawler Tractors only after 1944. Prior to 1945 some Garden Tractors may have been included but the number was small.

[3] Motor Tillers included after 1964.

[4] Estimated at wholesale level by dividing **Value of Manufacturers' Shipments** by **Units Shipped** and by **Maximum Belt Horsepower**, data are published in "Current Industrial Reports" of the Bureau of the Census.

Principal Machines on Farms—1979

	WHEEL AND CRAWLER TRACTORS						TRACTOR MOLDBOARD PLOWS	
STATE	1954 Census Number	1959 Census Number	1964 Census Number	1969 Census Number	1974 Census Number	Estimated July 1, 1979 Number	Estimated July 1, 1958 Number	Estimated July 1, 1979 Number
Maine	16,800	17,793	16,290	14,252	13,493	12,320	12,400	7,500
New Hampshire	6,635	6,605	6,253	4,953	4,989	4,660	4,600	2,840
Vermont	14,183	16,669	16,333	15,227	14,706	13,660	10,200	8,200
Massachusetts	12,656	12,068	11,575	9,537	9,341	8,315	8,800	6,000
Rhode Island	1,256	1,651	1,687	1,359	1,359	1,225	1,000	860
Connecticut	11,286	11,219	9,963	8,679	7,924	7,300	7,700	4,970
New York	129,741	138,670	136,304	122,645	118,313	110,700	107,000	81,900
New Jersey	25,223	24,726	22,042	19,984	19,324	17,600	21,500	16,000
Pennsylvania	137,476	144,759	144,149	126,810	124,251	114,800	118,600	96,400
Delaware	7,826	8,259	7,992	7,555	7,631	7,320	6,700	6,150
Maryland	35,774	37,291	37,203	34,174	34,705	32,630	30,500	26,780
NORTHEAST	**398,856**	**419,710**	**409,791**	**365,175**	**356,036**	**330,530**	**329,000**	**257,600**
Ohio	198,306	204,681	199,694	194,962	188,580	181,000	161,000	152,400
Indiana	176,016	186,853	181,086	174,055	167,382	161,300	149,000	137,100
Illinois	265,722	290,002	287,480	275,203	272,093	262,000	210,000	186,000
Iowa	297,015	327,863	329,172	318,998	317,052	300,600	235,000	216,400
Missouri	168,428	191,512	198,095	201,513	189,672	178,000	135,000	128,200
CORN BELT	**1,105,487**	**1,200,911**	**1,195,527**	**1,164,731**	**1,134,779**	**1,082,900**	**890,000**	**820,100**
Michigan	166,791	169,782	169,920	152,741	143,569	133,100	139,000	105,100
Wisconsin	213,903	234,387	247,427	229,752	237,457	217,600	171,000	152,300
Minnesota	249,332	275,833	284,887	258,614	260,535	241,400	210,000	176,200
LAKE STATES	**630,026**	**680,002**	**702,234**	**641,107**	**641,561**	**592,100**	**520,000**	**433,600**
North Dakota	112,558	121,039	122,056	118,069	123,072	116,800	84,000	74,700
South Dakota	109,123	115,639	120,100	111,532	114,546	104,500	84,000	72,100
Nebraska	159,977	175,254	180,423	166,098	170,423	159,300	108,000	90,800
Kansas	168,506	173,651	174,185	163,180	161,276	150,900	123,000	96,600
GREAT PLAINS	**550,164**	**585,764**	**596,764**	**558,879**	**569,317**	**531,500**	**399,000**	**334,200**
West Virginia	18,162	21,995	23,926	23,842	23,265	21,870	15,400	14,900
Kentucky	83,842	103,415	118,404	137,105	129,069	128,700	71,000	68,900
Tennessee	84,869	97,800	108,319	122,528	110,941	111,900	43,000	48,800
Virginia	64,750	75,143	78,989	79,347	76,121	74,800	52,000	47,100
North Carolina	120,59[illegible]	140,639	149,850	150,825	130,140	132,000	57,600	54,100
APPALACHIAN	**372,218**	**438,992**	**479,488**	**513,647**	**469,536**	**469,270**	**239,000**	**233,800**
South Carolina	44,631	48,637	50,931	50,115	45,321	47,140	9,200	11,800
Georgia	85,192	89,392	89,049	84,366	77,067	83,500	23,500	24,200
Florida	31,858	35,820	41,295	42,958	44,192	47,260	12,300	15,200
Alabama	62,526	67,559	71,925	75,069	68,521	70,500	20,500	23,200
SOUTHEAST	**224,207**	**241,408**	**253,200**	**252,508**	**235,101**	**248,400**	**65,500**	**74,400**
Mississippi	79,575	84,425	90,347	88,677	76,808	79,700	29,700	28,200
Louisiana	49,985	53,229	60,618	63,194	55,933	58,700	15,400	17,100
Arkansas	79,799	83,852	90,993	86,977	78,083	82,000	41,900	40,600
DELTA STATES	**209,359**	**221,506**	**241,958**	**238,848**	**210,824**	**220,400**	**87,000**	**85,900**
Oklahoma	101,885	102,323	101,605	102,397	91,661	88,700	74,000	64,700
Texas	268,613	268,233	269,519	282,088	251,687	248,500	74,500	69,100
SOUTHERN PLAINS	**370,498**	**370,556**	**371,124**	**384,485**	**343,348**	**337,200**	**148,500**	**133,800**
Montana	54,163	59,510	61,832	58,729	58,457	54,000	30,500	27,000
Idaho	49,753	56,961	58,607	54,091	55,419	52,000	40,000	35,400
Wyoming	18,700	20,737	21,596	20,925	20,801	18,830	15,400	14,700
Colorado	59,647	64,051	63,906	59,112	58,091	53,000	34,000	29,200
New Mexico	16,817	17,146	17,919	15,998	17,021	16,000	11,300	9,100
Arizona	13,506	13,443	13,747	12,136	13,812	14,270	4,200	4,000
Utah	19,445	21,803	22,256	20,128	21,110	20,050	17,500	15,800
Nevada	4,356	5,297	5,557	5,318	5,515	4,900	3,100	2,600
MOUNTAIN STATES	**236,387**	**258,948**	**265,420**	**246,437**	**250,226**	**233,050**	**156,000**	**137,800**
Washington	57,048	63,114	65,813	58,600	59,542	56,400	42,000	38,900
Oregon	54,206	56,732	58,741	51,223	52,651	49,250	44,000	40,400
California	136,778	147,390	142,812	138,914	140,393	135,000	70,000	67,500
PACIFIC	**248,032**	**267,236**	**267,366**	**248,737**	**252,586**	**240,650**	**156,000**	**146,800**
TOTAL	**4,345,234**	**4,684,852**	**4,782,872**	**4,614,554**	**4,463,314**	**4,286,000**	**2,990,000**	**2,658,000**

Principal Machines on Farms—1979

STATE	COMBINES[1]					CORN HEADS FOR COMBINES[2]		
	1959 Census Number	1964 Census Number	1969 Census Number	1974 Census Number	Estimated July 1, 1979 Number	1969 Census Number	1974 Census Number	Estimated July 1, 1979 Number
Maine	1,077	875	218	242	245	120	141	145
New Hampshire	39	27	8	5	5	65	55	50
Vermont	431	344	113	87	75	175	238	255
Massachusetts	98	70	34	35	30	84	103	105
Rhode Island	24	20	5	7	5	21	10	10
Connecticut	112	77	40	15	10	92	85	75
New York	18,702	16,536	4,902	5,114	4,880	1,706	2,344	2,900
New Jersey	2,239	1,726	634	766	840	269	324	400
Pennsylvania	26,431	23,939	6,777	7,297	7,070	1,924	2,636	3,400
Delaware	1,903	1,780	979	1,127	1,130	566	681	780
Maryland	5,934	5,237	2,604	2,740	2,840	1,555	1,954	2,340
NORTHEAST	**56,990**	**50,631**	**16,314**	**17,435**	**17,130**	**6,577**	**8,571**	**10,460**
Ohio	57,060	50,291	20,805	26,009	26,850	11,892	17,515	21,900
Indiana	54,238	46,395	23,871	29,485	31,000	17,920	24,616	30,200
Illinois	93,366	80,857	48,116	55,085	56,200	37,649	46,362	54,100
Iowa	99,709	86,178	28,221	42,117	45,500	22,302	37,864	49,000
Missouri	51,993	44,535	24,208	26,253	26,600	16,112	18,278	20,000
CORN BELT	**356,366**	**308,256**	**145,221**	**178,949**	**186,150**	**105,875**	**144,635**	**175,200**
Michigan	45,764	41,360	13,053	14,649	14,200	4,306	7,098	8,950
Wisconsin	45,032	45,516	10,859	13,392	12,900	3,566	5,147	6,700
Minnesota	73,278	71,748	27,189	35,033	35,350	12,102	18,780	23,500
LAKE STATES	**164,074**	**158,624**	**51,101**	**63,074**	**62,450**	**19,974**	**31,025**	**39,150**
North Dakota	48,732	41,782	26,952	27,273	26,600	753	864	990
South Dakota	33,206	28,289	11,926	13,941	13,800	3,483	5,386	6,700
Nebraska	53,343	43,205	25,730	29,224	29,650	13,370	18,578	22,600
Kansas	72,115	59,813	41,601	41,871	41,250	6,533	8,038	9,100
GREAT PLAINS	**207,396**	**173,089**	**107,209**	**112,309**	**111,300**	**24,139**	**32,866**	**39,390**
West Virginia	951	1,020	245	307	280	147	199	215
Kentucky	10,617	9,737	4,565	6,329	6,700	3,196	4,390	5,550
Tennessee	13,003	11,537	5,773	6,843	7,550	2,458	2,734	3,200
Virginia	10,133	9,281	3,769	4,309	4,330	2,243	2,972	3,520
North Carolina	17,335	14,847	7,982	8,828	9,300	5,279	6,696	7,970
APPALACHIAN	**52,039**	**46,422**	**22,334**	**26,616**	**28,160**	**13,323**	**16,991**	**20,455**
South Carolina	8,595	7,085	4,483	4,706	5,030	1,803	2,285	2,830
Georgia	10,340	9,177	5,408	6,255	7,200	4,036	4,836	5,900
Florida	1,055	1,230	1,010	1,182	1,360	584	773	1,010
Alabama	5,116	4,806	3,423	3,988	4,480	1,635	1,858	2,160
SOUTHEAST	**25,106**	**22,298**	**14,324**	**16,131**	**18,070**	**8,058**	**9,752**	**11,900**
Mississippi	7,369	6,099	6,977	6,893	7,960	441	310	290
Louisiana	5,078	5,145	6,414	7,034	7,640	357	231	210
Arkansas	13,750	13,086	12,657	11,484	12,600	294	725	680
DELTA STATES	**26,197**	**24,330**	**26,048**	**25,411**	**28,200**	**1,092**	**1,266**	**1,180**
Oklahoma	27,038	21,668	14,909	14,797	14,500	457	511	570
Texas	40,723	31,355	21,223	19,394	20,000	1,743	1,858	2,430
SOUTHERN PLAINS	**67,761**	**53,023**	**36,132**	**34,191**	**34,500**	**2,200**	**2,369**	**3,000**
Montana	18,063	16,011	11,687	11,392	11,000	121	107	100
Idaho	12,703	11,330	7,639	8,113	8,000	202	252	285
Wyoming	3,757	2,962	1,523	1,690	1,620	112	149	185
Colorado	13,799	11,062	6,937	7,338	7,070	1,032	1,632	2,100
New Mexico	2,358	1,898	1,041	1,229	1,160	52	117	170
Arizona	824	559	412	530	640	25	23	25
Utah	3,136	2,421	1,442	1,442	1,370	134	196	225
Nevada	402	277	201	253	240	9	21	20
MOUNTAIN STATES	**55,042**	**46,520**	**30,882**	**31,987**	**31,100**	**1,687**	**2,497**	**3,110**
Washington	10,800	9,706	6,891	7,330	7,320	307	269	290
Oregon	10,587	8,372	5,107	5,266	5,200	167	106	85
California	9,169	8,366	5,619	5,373	5,420	633	696	780
PACIFIC	**30,556**	**26,444**	**17,617**	**17,969**	**17,940**	**1,107**	**1,071**	**1,155**
TOTAL	**1,041,527**	**909,637**	**467,182**	**524,072**	**535,000**	**184,032**	**251,043**	**305,000**

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[1] The Census in 1959 and 1964 included self-propelled and pull types. The Census in 1969 and 1974 and the estimated number for July 1, 1979 cover only the number of self-propelled combines.

[2] The Census in 1969 included only corn heads on class 1-5 farms, those with $2,500 or more of income. The Census in 1974 and the estimated number for July 1, 1979 cover all farms.

Principal Machines on Farms—1979

STATE	PICK-UP BALERS 1959 Census Number	1964 Census Number	1969 Census Number	1974 Census Number	Estimated July 1, 1979 Number	FIELD FORAGE HARVESTERS[1] 1964 Census Number	1969 Census Number	1974 Census Number	Estimated July 1, 1979 Number
Maine	3,137	3,339	2,446	2,255	2,050	998	712	914	1,370
New Hampshire	1,673	1,681	1,266	1,197	1,075	747	385	612	930
Vermont	5,210	5,796	4,171	3,975	3,370	2,358	1,542	2,328	3,200
Massachusetts	2,379	2,343	1,774	1,600	1,380	1,412	744	923	1,220
Rhode Island	247	250	171	172	145	233	88	122	150
Connecticut	2,110	1,971	1,604	1,313	1,230	1,561	788	777	890
New York	36,724	38,107	31,074	27,495	23,000	20,710	13,815	17,363	23,300
New Jersey	3,258	3,073	2,357	2,066	1,750	2,181	1,171	1,127	1,280
Pennsylvania	38,491	41,873	35,571	32,195	27,000	20,794	12,240	15,485	23,000
Delaware	856	664	609	628	550	475	245	422	640
Maryland	6,599	6,845	5,750	5,159	4,300	3,961	2,177	2,603	3,800
NORTHEAST	**100,684**	**105,942**	**86,793**	**78,055**	**65,850**	**55,430**	**33,907**	**42,676**	**59,780**
Ohio	41,809	43,607	40,101	36,137	29,320	11,759	7,788	9,757	14,520
Indiana	25,835	25,459	23,414	21,705	17,650	7,523	5,344	6,121	7,800
Illinois	38,792	38,163	33,291	29,822	23,050	16,295	10,130	11,333	14,770
Iowa	58,558	60,111	55,456	47,461	36,700	20,937	14,245	17,179	24,280
Missouri	31,697	36,265	38,929	38,487	30,850	9,315	6,884	7,430	8,270
CORN BELT	**196,691**	**203,605**	**191,191**	**173,612**	**137,570**	**65,829**	**44,391**	**51,820**	**69,640**
Michigan	28,414	31,502	26,915	23,897	19,500	15,077	8,986	11,682	17,080
Wisconsin	53,836	63,921	56,939	54,962	46,200	48,149	27,199	38,341	56,500
Minnesota	45,583	55,896	51,600	46,689	37,600	26,024	17,761	20,825	27,980
LAKE STATES	**127,833**	**151,319**	**135,454**	**125,548**	**103,300**	**89,250**	**53,946**	**70,848**	**101,560**
North Dakota	13,882	15,823	15,623	14,831	11,400	9,555	6,614	5,911	5,970
South Dakota	13,117	14,441	14,657	13,835	10,800	10,810	9,755	11,254	17,270
Nebraska	18,684	19,907	18,988	17,309	13,750	13,268	11,232	12,632	14,100
Kansas	24,595	28,086	27,464	26,846	21,800	17,035	11,712	10,651	11,550
GREAT PLAINS	**70,278**	**78,257**	**76,732**	**72,821**	**57,750**	**50,668**	**39,313**	**40,448**	**48,890**
West Virginia	5,459	7,362	8,013	7,444	6,650	1,155	1,143	1,478	1,810
Kentucky	18,397	21,476	24,121	23,536	19,600	3,157	3,621	4,400	5,310
Tennessee	13,103	15,234	17,686	17,090	15,400	3,002	2,953	3,602	4,500
Virginia	14,419	16,105	16,035	15,285	12,900	4,450	4,181	4,675	5,450
North Carolina	10,087	10,322	10,053	10,115	8,600	3,365	2,695	3,841	4,600
APPALACHIAN	**61,465**	**70,499**	**75,908**	**73,470**	**63,150**	**15,129**	**14,593**	**17,996**	**21,670**
South Carolina	4,325	4,468	3,857	3,719	3,300	1,139	887	1,075	1,310
Georgia	5,875	6,917	7,118	6,678	6,300	1,696	1,455	1,722	2,300
Florida	1,032	1,419	1,692	1,910	2,000	543	447	629	710
Alabama	4,361	6,231	7,227	7,662	7,250	1,233	1,250	1,513	1,900
SOUTHEAST	**15,593**	**19,035**	**19,894**	**19,969**	**18,850**	**4,611**	**4,039**	**4,939**	**6,220**
Mississippi	6,065	6,618	7,045	7,431	6,640	1,697	1,531	2,130	2,630
Louisiana	3,987	5,064	4,831	4,594	4,150	775	763	872	1,210
Arkansas	6,206	6,456	7,500	8,040	7,900	1,181	1,014	1,047	1,200
DELTA STATES	**16,258**	**18,138**	**19,376**	**20,065**	**18,690**	**3,653**	**3,308**	**4,049**	**5,040**
Oklahoma	11,353	12,965	14,246	14,432	13,650	2,820	1,872	1,740	2,000
Texas	13,591	15,737	18,208	18,534	19,000	4,643	3,556	3,215	3,900
SOUTHERN PLAINS	**24,944**	**28,702**	**32,454**	**32,966**	**32,650**	**7,463**	**5,428**	**4,955**	**5,900**
Montana	9,211	11,458	11,059	10,613	9,200	1,736	1,695	1,512	1,730
Idaho	11,323	13,072	12,057	12,048	10,720	2,696	1,907	2,048	2,410
Wyoming	3,496	4,259	4,357	4,383	3,980	1,086	924	995	1,190
Colorado	8,095	9,600	9,504	9,505	8,400	5,252	3,744	3,755	4,370
New Mexico	2,150	2,340	2,532	2,833	2,740	560	490	591	750
Arizona	995	1,001	860	1,018	900	556	281	314	480
Utah	5,891	6,389	5,887	5,957	5,530	1,989	1,378	1,560	1,920
Nevada	1,116	1,264	1,177	1,299	1,120	291	189	233	320
MOUNTAIN STATES	**42,277**	**49,383**	**47,433**	**47,656**	**42,590**	**14,166**	**10,608**	**11,008**	**13,170**
Washington	8,085	9,759	8,658	8,215	7,480	3,734	1,837	2,234	3,430
Oregon	6,482	8,007	7,218	7,195	6,650	2,419	1,532	1,496	2,190
California	9,164	8,389	6,829	6,435	5,470	3,189	1,666	2,006	3,510
PACIFIC	**23,731**	**26,155**	**22,705**	**21,845**	**19,600**	**9,342**	**5,035**	**5,736**	**9,130**
TOTAL	**679,754**	**751,035**	**707,940**	**666,007**	**560,000**	**315,541**	**214,568**	**254,475**	**341,000**

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[1] The Census in 1964 and the estimated number for July 1, 1979 include shear-bar and flail types. The Census in 1969 and 1974 covered only the number of shear-bar harvesters.

Principal Machines on Farms—1979

	POWER TRACTOR MOWERS (Cutter bar type only)		SIDE DELIVERY RAKES		MOWER CONDITIONERS[1]	
STATE	Estimated July 1, 1958 Number	Estimated July 1, 1979 Number	Estimated July 1, 1958 Number	Estimated July 1, 1979 Numbur	1974 Census Number	Estimated July 1, 1979 Number
Maine	9,000	6,770	10,000	5,560	1,378	1,850
New Hampshire	4.400	3,090	5,000	2,370	605	850
Vermont	10,000	9,000	10,300	6,940	2,776	3,750
Massachusetts	5,800	4,050	6,000	3,320	1,048	1,370
Rhode Island	550	350	500	300	102	125
Connecticut	4,500	3,530	4,000	2,350	786	1,090
New York	55,000	56,100	61,000	43,900	18,701	24,570
New Jersey	7,000	4,540	8,000	3,780	1,636	1,970
Pennsylvania	60,000	62,300	67,000	46,400	20,428	26,200
Delaware	1,750	1,100	2,200	970	525	640
Maryland	14,000	11,470	13,000	8,500	3,614	4,350
NORTHEAST	**172,000**	**162,300**	**187,000**	**124,390**	**51,599**	**66,765**
Ohio	70,000	66,200	86,000	53,900	20,268	25,250
Indiana	64,000	52,000	71,000	39,600	12,503	15,500
Illinois	106,000	72,300	86,000	51,500	18,793	22,100
Iowa	115,000	107,500	127,000	86,400	19,636	25,370
Missouri	80,000	86,600	50,000	50,600	17,228	23,130
CORN BELT	**435,000**	**384,600**	**420,000**	**282,000**	**88,428**	**111,350**
Michigan	48,000	49,750	85,000	41,600	15,924	19,450
Wisconsin	93,000	106,600	115,000	86,700	36,232	48,300
Minnesota	96,000	99,250	108,000	84,000	22,979	28,300
LAKE STATES	**237,000**	**255,600**	**308,000**	**212,300**	**75,135**	**96,050**
North Dakota	42,000	41,500	26,000	22,200	5,971	6,450
South Dakota	44,000	48,100	31,000	22,300	4,445	4,800
Nebraska	61,000	58,100	41,000	34,400	9,225	11,280
Kansas	62,000	56,600	42,000	35,600	9,247	12,340
GREAT PLAINS	**209,000**	**204,300**	**140,000**	**114,500**	**28,888**	**34,870**
West Virginia	14,000	19,100	8,000	9,400	3,484	4,250
Kentucky	48,000	51,250	28,000	30,400	14,718	18,820
Tennessee	47,000	55,050	25,500	24,000	12,037	15,000
Virginia	28,000	33,850	25,500	23,600	8,714	11,070
North Carolina	27,000	33,150	15,000	15,500	6,824	8,380
APPALACHIAN	**164,000**	**192,400**	**102,000**	**102,900**	**45,777**	**57,520**
South Carolina	12,500	10,660	7,500	5,920	2,471	3,090
Georgia	23,000	19,800	12,000	10,500	6,383	7,560
Florida	7,500	4,000	2,200	1,910	4,000	4,570
Alabama	19,000	18,100	7,300	7,530	5,367	6,500
SOUTHEAST	**62,000**	**52,560**	**29,000**	**25,860**	**18,221**	**21,720**
Mississippi	21,000	23,140	5,000	9,700	5,282	6,360
Louisiana	12,000	11,740	6,000	6,150	4,421	5,000
Arkansas	24,000	22,300	12,000	10,400	5,521	7,460
DELTA STATES	**57,000**	**57,180**	**23,000**	**26,250**	**15,224**	**18,820**
Oklahoma	37,000	34,000	22,000	19,600	7,703	10,350
Texas	48,000	49,700	21,000	22,600	19,487	24,800
SOUTHERN PLAINS	**85,000**	**83,700**	**43,000**	**42,200**	**27,190**	**35,150**
Montana	23,000	22,800	15,000	13,750	3,205	3,660
Idaho	27,000	22,380	23,000	16,400	3,367	3,890
Wyoming	10,500	6,410	6,000	5,150	1,179	1,450
Colorado	24,000	16,880	25,000	14,600	2,712	3,250
New Mexico	8,000	4,970	8,000	4,200	1,005	1,125
Arizona	4,500	2,120	3,700	1,400	427	465
Utah	11,700	12,000	12,000	9,300	2,257	3,000
Nevada	2,300	1,670	2,300	1,500	384	415
MOUNTAIN STATES	**111,000**	**89,230**	**95,000**	**66,300**	**14,536**	**17,255**
Washington	27,000	22,670	16,000	13,400	4,218	4,980
Oregon	23,000	21,180	15,000	11,900	3,634	4,670
California	33,000	25,280	22,000	14,000	3,590	3,850
PACIFIC	**83,000**	**69,130**	**53,000**	**39,300**	**11,442**	**13,500**
TOTAL	**1,615,000**	**1,551,000**	**1,400,000**	**1,036,000**	**376,440**	**473,000**

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[1] Does not include windrowers with conditioning rolls.

Principal Machines on Farms—1979

STATE	POWER ELEVATORS Estimated Jan. 1, 1951 Number	 Estimated Jan. 1, 1958 Number	 Estimated July 1, 1979 Number	Manure Spreaders Estimated July 1, 1979 Number	Corn and Cotton Planters Estimated July 1, 1979 Number	Grain Drills Estimated July 1, 1979 Number
Maine	1,200	12,000	4,700	3,200	340	810
New Hampshire			2,200	1,980	290	60
Vermont			7,050	6,200	1,580	320
Massachusetts			3,180	2,340	890	115
Rhode Island			450	290	110	30
Connecticut			3,700	2,350	1,000	80
New York	7,200	35,000	61,500	39,700	19,400	25,600
New Jersey	2,000	5,500	5,450	2,490	2,360	2,325
Pennsylvania	9,600	38,000	65,300	42,000	32,600	38,600
Delaware	500	2,000	3,480	1,750	2,080	1,930
Maryland	2,500	7,500	14,300	8,550	8,340	8,600
NORTHEAST	**23,000**	**100,000**	**171,310**	**110,850**	**68,990**	**78,470**
Ohio	27,000	68,000	112,000	58,100	62,500	60,900
Indiana	30,000	66,000	111,200	52,200	64,000	49,200
Illinois	61,000	110,000	170,000	76,500	93,000	61,900
Iowa	80,000	122,000	179,000	103,300	104,300	57,700
Missouri	15,000	41,000	79,500	59,500	49,300	49,900
CORN BELT	**213,000**	**407,000**	**651,700**	**349,600**	**373,100**	**279,600**
Michigan	14,000	45,000	79,500	37,850	37,700	49,000
Wisconsin	15,000	48,000	125,000	85,300	66,200	61,700
Minnesota	46,000	90,000	140,500	79,100	79,800	71,700
LAKE STATES	**75,000**	**183,000**	**345,000**	**202,250**	**183,700**	**182,400**
North Dakota	28,000	45,000	68,000	21,770	15,100	56,800
South Dakota	24,000	40,000	60,800	30,320	30,500	32,200
Nebraska	36,000	60,000	93,600	46,800	44,900	41,100
Kansas	25,000	55,000	100,000	39,400	22,100	67,600
GREAT PLAINS	**113,000**	**200,000**	**322,400**	**138,290**	**112,600**	**197,700**
West Virginia	500	3,000	6,000	8,770	5,170	3,500
Kentucky	2,500	10,000	23,100	29,200	38,300	10,900
Tennessee	1,000	6,500	14,200	21,450	51,600	13,700
Virginia	2,000	11,000	18,000	22,820	26,000	16,700
North Carolina	1,000	7,500	19,300	22,200	73,100	22,200
APPALACHIAN	**7,000**	**38,000**	**80,600**	**104,440**	**194,170**	**67,000**
South Carolina	300	2,000	4,400	4,180	30,700	11,500
Georgia	900	6,000	13,200	7,000	38,800	9,800
Florida	300	1,500	3,480	1,190	6,050	1,700
Alabama	500	4,500	10,820	4,750	42,200	6,930
SOUTHEAST	**2,000**	**14,000**	**31,900**	**17,120**	**117,750**	**29,930**
Mississippi	700	4,500	7,400	5,370	52,800	8,150
Louisiana	400	1,000	2,430	3,050	19,900	7,350
Arkansas	900	4,500	9,050	7,400	21,600	13,100
DELTA STATES	**2,000**	**10,000**	**18,880**	**15,820**	**94,300**	**28,600**
Oklahoma	6,000	12,000	24,100	9,700	9,500	31,600
Texas	9,000	23,000	38,400	18,080	55,700	49,200
SOUTHERN PLAINS	**15,000**	**35,000**	**62,500**	**27,780**	**65,200**	**80,800**
Montana	7,500	17,500	26,800	11,230	1,110	21,300
Idaho	3,100	13,300	23,400	14,100	2,680	15,800
Wyoming	700	2,500	4,800	4,900	980	4,100
Colorado	7,000	13,000	23,900	14,550	6,200	15,700
New Mexico	500	1,500	2,500	2,400	3,180	1,930
Arizona	100	700	1,710	1,000	1,950	1,420
Utah	700	5,000	9,650	7,700	1,730	5,430
Nevada	400	500	910	1,140	60	320
MOUNTAIN STATES	**20,000**	**54,000**	**93,670**	**57,020**	**17,890**	**66,000**
Washington	2,000	8,000	20,800	15,050	1,850	12,500
Oregon	3,000	8,000	16,800	13,160	1,150	11,850
California	4,000	13,000	22,440	15,620	9,300	9,150
PACIFIC	**9,000**	**29,000**	**60,040**	**43,830**	**12,300**	**33,500**
TOTAL	**479,000**	**1,070,000**	**1,838,000**	**1,067,000**	**1,240,000**	**1,044,000**

Principal Machines on Farms—1979

STATE	MOTOR TRUCKS 1954 Adj. Cen. 1,000's[1]	1959 Census 1,000's	1964 Census 1,000's	1969 Census 1,000's	1974 Census 1,000's	Estimated July 1, 1979 1,000's	Internal Combustion Engines[2] Estimated July 1, 1979 Number	Chain Saws Estimated July 1, 1979 Number
Maine	18.1	17.3	14.8	12.1	11.3	10.8	1,450	7,400
New Hampshire	8.3	6.8	5.6	4.0	3.7	3.5	1,350	2,500
Vermont	11.1	10.0	8.1	6.1	6.2	6.2	1,900	6,250
Massachusetts	14.3	12.3	10.6	8.4	7.7	7.2	1,900	4,500
Rhode Island	1.9	1.9	1.8	1.2	1.2	1.2	210	630
Connecticut	13.2	11.0	9.9	7.4	6.2	5.4	1,740	3,800
New York	70.5	66.5	62.9	53.6	53.6	53.0	23,000	49,500
New Jersey	24.4	20.9	17.3	14.3	12.9	12.2	2,650	5,900
Pennsylvania	71.0	71.4	69.5	57.3	55.5	54.5	23,500	43,300
Delaware	5.2	5.3	5.2	5.1	5.7	6.0	1,000	2,500
Maryland	22.0	21.2	21.3	19.5	21.3	22.0	5,000	12,100
NORTHEAST	**260.0**	**244.6**	**227.0**	**189.0**	**185.3**	**182.0**	**63,700**	**138,380**
Ohio	77.0	81.5	91.4	93.7	97.8	100.5	21,700	60,500
Indiana	77.4	88.2	99.0	100.1	103.9	106.2	22,500	65,500
Illinois	99.9	113.7	120.9	129.3	139.9	145.2	33,000	71,000
Iowa	84.3	99.8	106.7	121.4	137.1	146.0	34,700	56,300
Missouri	95.8	109.7	123.0	132.5	134.0	134.8	35,500	94,200
CORN BELT	**434.4**	**492.9**	**541.0**	**577.0**	**612.7**	**632.7**	**147,400**	**347,500**
Michigan	70.5	75.7	80.5	74.6	73.6	72.8	19,700	45,500
Wisconsin	87.0	90.6	97.0	89.0	92.3	93.2	37,000	92,300
Minnesota	90.0	103.4	112.5	116.9	130.1	137.2	52,500	65,700
LAKE STATES	**247.5**	**269.7**	**290.0**	**280.5**	**296.0**	**303.2**	**109,200**	**203,500**
North Dakota	66.8	75.5	81.6	91.2	101.3	105.2	38,500	4,300
South Dakota	47.7	52.3	56.5	57.8	65.1	68.3	25,800	3,300
Nebraska	72.0	83.4	93.1	96.4	108.5	115.5	34,000	14,000
Kansas	112.1	122.3	134.0	141.3	150.9	157.2	45,000	23,000
GREAT PLAINS	**298.6**	**333.5**	**365.2**	**386.7**	**425.8**	**446.2**	**143,300**	**44,600**
West Virginia	26.0	24.7	24.1	19.5	16.9	15.4	5,350	21,500
Kentucky	66.7	74.9	90.5	97.1	95.8	95.2	17,800	44,200
Tennessee	71.6	76.8	86.3	92.8	88.1	85.3	13,500	58,500
Virginia	57.5	58.0	59.2	55.9	55.5	54.8	13,100	48,700
North Carolina	84.5	91.1	101.1	99.3	93.5	90.0	17,000	87,300
APPALACHIAN	**306.3**	**325.5**	**361.2**	**364.6**	**349.8**	**340.7**	**66,750**	**260,200**
South Carolina	39.2	39.1	39.0	35.3	33.7	32.5	6,650	24,500
Georgia	76.2	72.8	76.6	70.9	69.2	68.0	13,800	33,850
Florida	36.6	36.4	40.6	37.8	40.1	41.6	13,300	7,700
Alabama	63.7	63.4	69.5	67.4	64.4	62.7	11,500	31,850
SOUTHEAST	**215.7**	**211.7**	**225.7**	**211.4**	**207.4**	**204.8**	**45,250**	**97,900**
Mississippi	76.2	71.5	75.1	66.4	60.5	57.5	11,000	37,700
Louisiana	47.3	47.2	51.3	44.7	41.6	39.8	12,000	20,500
Arkansas	76.2	73.2	80.6	71.4	69.5	68.3	14,700	31,600
DELTA STATES	**199.7**	**191.9**	**207.0**	**182.5**	**171.6**	**165.6**	**37,700**	**89,800**
Oklahoma	85.7	92.7	105.1	106.8	101.6	98.5	22,200	10,150
Texas	187.8	197.8	211.0	227.6	208.1	196.0	62,500	19,750
SOUTHERN PLAINS	**273.5**	**290.5**	**316.1**	**334.4**	**309.7**	**294.5**	**84,700**	**29,900**
Montana	48.5	52.8	58.2	58.3	61.9	63.7	20,200	12,200
Idaho	38.7	44.0	48.3	47.1	51.4	53.5	16,300	13,550
Wyoming	15.0	16.2	17.7	18.4	19.2	19.7	6,400	3,280
Colorado	48.5	51.7	55.9	55.5	56.9	57.8	20,600	6,150
New Mexico	21.3	20.3	23.4	18.8	20.0	20.6	7,800	3,050
Arizona	13.5	16.8	17.2	12.1	14.4	16.1	5,100	520
Utah	18.0	18.8	20.3	18.3	19.4	20.3	6,700	2,450
Nevada	3.9	4.5	4.5	5.0	5.4	5.6	1,500	620
MOUNTAIN STATES	**207.4**	**225.1**	**245.5**	**233.5**	**248.6**	**257.3**	**84,600**	**41,820**
Washington	55.4	60.2	64.2	56.7	57.1	57.3	17,400	23,200
Oregon	47.7	48.9	53.6	46.2	49.6	51.6	22,000	26,500
California	128.8	131.0	126.1	115.7	118.8	121.1	64,000	32,700
PACIFIC	**231.9**	**240.1**	**243.9**	**218.6**	**225.5**	**230.0**	**103,400**	**82,400**
TOTAL	**2,675.0**	**2,825.5**	**3,022.6**	**2,978.2**	**3,032.4**	**3,057.0**	**886,000**	**1,336,000**

---

[1] Census numbers have been adjusted to bring them more in line with 1959 and later data based on the new definition of a farm.

[2] Includes engines used for stationary work such as irrigation, auxiliary engines on combines, balers, etc., and a small number of power units not elsewhere classified.

NOTE

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Cover 1, p. 3,

p. 12, 36.

C 4725-1

November 21, 1979
ONE DOLLAR

Serving the Farm and Industrial Equipment Industry Since 1886

Implement&Tractor

Dealers who back up their salesmen page 8

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Massey Ferguson
230

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More About Metrics page 18

Auction Prices page 12

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INTERTEC PUBLISHING CORP.

November 21, 1979 • Vol. 94 • No. 23

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

8: **Salesmen Need Guidance from the Sales Manager.** Visits with three Mississippi Delta dealers turned up a number of "rules to sell by" that have worked for them: "Let salesmen make their own deals"—"Salesmen have got to be hungry"—"Take all the detail you can off the salesman"—along with much more good advice for dealers and sales managers.

18: **Metric System, II: Converting from System to System.** A look at how the basic metric units of weight, length and measure relate, along with a few words about some important things to remember when converting to or from the English system.

24: **Blown Down—But Not Out.** A devastating Texas tornado made short work of Cardinal Equipment Co.'s facilities and inventory, but all the people survived and built the company back up with the help of invaluable business records preserved in the International Harvester computer center.

30: **FIEI Considers 'Opportunities of the Eighties.'** Prospects for the new decade seemed to be on everybody's mind as a record number of FIEI conventioners considered transportation, trade with China, technological advances, analysts and humanitarians, and other important topics.

DEPARTMENTS

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I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

YODER & FREY, INC.
Archbold, Ohio
(October 9, 1979)

ALLIS-CHALMERS TRACTORS

D15, ldr., 1964 (Good)	2350
D15, plow, 1963 (Fair)	1600
D14, 1959 (Fair)	1250*
D14, (Rough)	975
WD45, 1956 (Fair)	950*
WD45, 1954 (Fair)	825
CA, 1951 (Good)	750
G, plow, cult., 1950 (Good)	1080
G, plow, cult., 1950 (Fair)	950

CASE TRACTORS

1470, diesel, 1971 (Fair)	10,500*
1370 diesel, 1974 (Good)	10,150
1370 diesel, 1974 (Good)	9900*
1170 diesel, 1973 (Good)	8200*
1070 diesel, 1974 (Good)	8100
1030 diesel, 1965 (Fair)	3075
970 diesel, 1972 (Good)	6000*
970 diesel, 1971 (Fair)	5250
930 diesel, 1964 (Fair)	2100*
830, 1967 (Good)	2550
830, 1962 (Rough)	1300*
730 diesel, duals, 1965 (Good)	3200
530, ldr., 1968 (Good)	3250
530, backhoe, ldr., (Good)	4450
530, ldr., 1965 (Good)	2750*
580, backhoe, ldr., (Good)	6300*
430 diesel, 1966 (Fair)	2100
300, 1955 (Fair)	500*

DAVID BROWN TRACTORS

1210 diesel, 1975 (Good)	4300*
1200 diesel, 1968 (Fair)	3000*
990 diesel, 1966 (Fair)	2800
990 diesel, 1966 (Fair)	2400*
990, 1967 (Fair)	1900*
885 diesel, 1974 (Good)	3400*

JOHN DEERE TRACTORS

4230 diesel, 1976 (Good)	12,500*
4020 diesel, 1966 (Good)	7100
4020 diesel, 1965 (Fair)	7000*
4020 diesel, 1964 (Good)	6500
4010 diesel, 1962 (Fair)	5100
3020 diesel, 1967 (Good)	5350
3020, 1967 (Good)	4000
2010, 1963 (Good)	2125
2010, 1963 (Fair)	1925
820 diesel, 1958 (Good)	2250
730 diesel, 1959 (Good)	3000*
730 diesel, 1959 (Rough)	1850*
730 diesel, 1958 (Good)	2650
730 diesel, 1958 (Fair)	2100*
410, backhoe, ldr.,	9600
70, 1953 (Rough)	1100
60, 1953 (Fair)	925*
60, 1953 (Rough)	525
A, 1949 (Fair)	550
A, 1949 (Fair)	500
H, 1948 (Fair)	500

FORD TRACTORS

4500, ldr., 1970 (Good)	3950
4000, 1975 (Good)	5000*
4000 diesel, 1973 (Good)	4550
4000, 1964 (Fair)	3000
4000, 1961 (Good)	2000
4000, 1961 (Good)	2000*
3400 diesel, 1970 (Fair)	2900
3000 diesel, 1974 (Excellent)	5025
2600, (New)	4600*
1600, mo., (New)	4000*
960, 1958 (Fair)	2200*
901, 1959 (Fair)	1275
860, 1958 (Good)	2300
860, 1958 (Fair)	1550
851, 1958 (Fair)	2050
741, ldr., 1958 (Fair)	1750
641, 1957 (Good)	1700
600, 1957 (Fair)	1350
Jub., ldr., 1956 (Fair)	2200*
Dexta, ldr., 1954 (Fair)	1700
8N, 1952 (Good)	1225*
8N, 1948 (Fair)	960
8N, 1948 (Fair)	750
8N, 1947 (Fair)	750*
9N, 1947 (Good)	1200*
9N, 1946 (Fair)	940*
9N, 1945 (Good)	900*
9N, bld., 1945 (Rough)	875
9N, 1945 (Rough)	720
9N, 1945 (Fair)	700
9N, 1942 (Fair)	700
9N, 1941 (Fair)	675
9N, 1941 (Fair)	650
9N, 1941 (Rough)	585

INTERNATIONAL HARVESTER TRACTORS

4100, 1973 (Good)	7000
1206 diesel, 1967 (Good)	6400*
1066 diesel, 1975 (Good)	9600*
1066 diesel, 1973 (Good)	9700*
856 diesel, 1971 (Good)	8000
806 diesel, 1966 (Good)	4700*
806, 1965 (Good)	5000*
806 diesel, 1965 (Good)	4850
806, 1965 (Rough)	3200*
806, 1964 (Good)	3650
806 diesel, 1964 (Fair)	3250
756, 1970 (Good)	4200*
706, 1966 (Good)	4200*
706, 1965 (Good)	3000*
706, 1964 (Fair)	2700
560 diesel, 1961 (Fair)	1875
560, 1961 (Good)	1800*
560 diesel, 1960 (Fair)	25[illegible]
560, 1960 (Rough)	190[illegible]
504, ldr., 1963 (Fair)	2600
450 diesel, 1957 (Rough)	925*
400, 1955 (Fair)	1150*
350, 1957 (Rough)	1000*
350, 1954 (Rough)	850
340, 1963 (Fair)	1425
340, (Rough)	1000
300, 1956 (Good)	1650
300, ldr., 1955 (Rough)	850*
230, cult., 1958 (Good)	1150
Sup. MTA, 1954 (Good)	1325
Sup. MTA, 1954 (Fair)	1100
Sup. M, ldr., 1953 (Rough)	850*
Sup. M, 1953 (Fair)	850*
M, ldr., 1950 (Good)	830
H, 1949 (Fair)	550
H, 1948 (Rough)	480
C, 1949 (Fair)	635
A, 1948 (Rough)	710
Cub, mo., 1955 (Good)	1150

MASSEY-FERGUSON TRACTORS

1800 diesel, (Good)	10,000*
1130 diesel, 1969 (Good)	5500*
1100 diesel, 1972 (Good)	5900*
1085 diesel, 1976 (Good)	7200
245, (New)	6500*
180, 1969 (Good)	3200*
165, 1969 (Good)	3375*
135, 1974 (Fair)	3225
135, 1967 (Good)	3150
135, 1966 (Good)	2500*
65, 1962 (Fair)	1725
65, 1961 (Good)	1950
65, 1961 (Fair)	1600
65, 1960 (Fair)	1400*
35, 1957 (Good)	1950*

MINNEAPOLIS-MOLINE TRACTORS

602, 1965 (Fair)	1900
U, (Rough)	375*

OLIVER TRACTORS

1950 turbo, 1969 (Good)	7100
1950 turbo, 1970 (Fair)	4400
1850 diesel, 1968 (Good)	5000*
1850 diesel, 1965 (Fair)	3550
1550 diesel, 1969 (Good)	3350
1600, 1964 (Good)	2500*
Sup. 88, (Fair)	610
Sup. 77, 1953 (Fair)	1000*
77,	450
66, ldr., 1952 (Fair)	800

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(October 9, 1979)

ALLIS-CHALMERS TRACTORS

6040 diesel, 1974 (Good)	3700
175 diesel, 1970 (Fair)	3250*
D17 diesel, 1965 (Good)	2550*
D15, 1967 (Fair)	1750*

CASE TRACTORS

1370 diesel, duals, cab, 1977 (Excellent)	11,000*
420, ldr., 1957 (Fair)	900*
320, ldr., backhoe, 1957 (Good)	2225

DAVID BROWN TRACTOR

780 diesel, 1968 (Good)	1500*

MASSEY-FERGUSON TRACTORS

1105 diesel, 1977 (Excellent)	11,000
1085 diesel, 1975 (Excellent)	9000
265 diesel, 1976 (Excellent)	7200*
180 diesel, 1968 (Fair)	3200*
180 diesel, 1967 (Fair)	3100*
180 diesel, 1967 (Fair)	2900
175 diesel, 1971 (Good)	4200
175 diesel, 1966 (Good)	4300
175 diesel, 1966 (Fair)	3300
165 diesel, 1966 (Good)	3300*
150 diesel, 1968 (Good)	3400
150 diesel, 1965 (Fair)	2900*
135 diesel, 1969 (Good)	3025*
135 diesel, 1968 (Good)	3000*
65, diesel, 1964 (Good)	2250
50 diesel, 1963 (Fair)	1850
35 diesel, 1962 (Fair)	950*
35 diesel, 1962 (Good)	1800*
35, 1959 (Good)	1800
35, 1959 (Fair)	1500
35, 1959 (Fair)	1500
T030, 1952 (Good)	1000*
T020, 1949 (Rough)	160
TE20, 1948 (Good)	875*

FORD-FERGUSON TRACTORS

9N, 1944 (Fair)	425
9N, 1944 (Fair)	550*
9N, 1941 (Good)	675*

FORD TRACTORS

9000 diesel, 1972 (Good)	4800*
8600 diesel, 1974 (Excellent)	6800
7700 diesel, 1978 (Excellent)	12,400*
5000 diesel, 1972 (Fair)	4300*
5000 diesel, 1968 (Good)	5200
5000 diesel, 1968 (Good)	4375
5000 diesel, 1968 (Fair)	3550*
4500 diesel, ldr., backhoe, 1968 (Good)	5000*
4400 diesel, trencher, 1968 (Good)	5200*
4400 diesel, ldr., 1967 (Fair)	3750*
4000 diesel, Select-O-Speed, 1967 (Fair)	850
4000 diesel, 1965 (Good)	2700
4000, Select-O-Speed, 1963 (Fair)	975*
4000, Select-O-Speed, 1963 (Fair)	1425
4000, 1963 (Fair)	1425
3600 diesel, 1978 (Good)	5200
3400 diesel, ldr., 1973 (Good)	4225
3400 diesel, ldr., 1967 (Fair)	1850*
3000 diesel, 1970 (Good)	3675
3000 diesel, 1969 (Good)	3500
2000 diesel, 1968 (Good)	3200
3000, 1968 (Good)	3225
3000, 1966 (Fair)	2975
2000 diesel, 1966 (Fair)	2800*
2000, 1963 (Fair)	1025
871, Select-O-Speed, 1958 (Fair)	1100*
861 diesel, 1958 (Good)	2200
861 diesel, 1958 (Fair)	1100*
850, 1956 (Good)	2200
850, 1955 (Good)	2000*
850, 1955 (Rough)	900
850, trencher, 1955 (Fair)	1375
850, 1955 (Good)	1925
841 diesel, 1958 (Fair)	1125
841, 1958 (Good)	2050
650, 1955 (Fair)	1100*
641, 1959 (Good)	2100*
641, 1958 (Fair)	1300
640, 1955 (Fair)	1300*
640, 1955 (Good)	2100*
621, 1960 (Good)	2125*
621, 1958 (Good)	2100*
Fdsn. Maj. diesel, 1954 (Rough)	185
Fdsn. Maj. diesel, ldr., 1954 (Good)	1000*
Fdsn. Maj. diesel, ldr., 1954 (Good)	900
Sup. Dexta, 1963 (Fair)	975
Sup. Dexta, 1963 (Good)	1800
Dexta, 1959 (Rough)	575
Jub., 1953 (Fair)	1550
Jub., 1953 (Good)	2000
Jub., 1953 (Fair)	1500*
Jub., 1953 (Good)	1800*
Jub., 1953 (Rough)	625
8N, 1952 (Good)	950
8N, 1952 (Good)	1550
8N, 1951 (Rough)	575*
8N, 1951 (Good)	1150
8N, 1950 (Fair)	900
8N, 1950 (Fair)	800

INTERNATIONAL HARVESTER TRACTORS

706 diesel, duals, 1965 (Fair)	2300*

(Continued on page 36)

(Continued from page 12)

706 diesel, 1965 (Good)	3700*
606 diesel, 1962 (Good)	900
574 diesel, 1972 (Fair)	2700*
574 diesel, 1972 (Good)	3700*
460 diesel, backhoe, 1959 (Fair)	1050
454 diesel, 1973 (Good)	2750*
454 diesel, 1972 (Excellent)	4600
444 diesel, 1969 (Fair)	1900*
2404, ldr., 1963 (Fair)	1100
Sup. M, 1953 (Good)	800*
M, corn picker, 1950 (Fair)	725
W6, 1946 (Rough)	160
Sup. H, corn picker, 1953 (Fair)	475*
140, 1959 (Good)	1500*
Sup. A, cult., har., 1950 (Good)	1175*
Sup. A, 1950 (Good)	1050
A, 1944 (Good)	325

JOHN DEERE TRACTORS

4020 diesel, 1969 (Good)	7950
4020 diesel, 1968 (Good)	7150*
3020 diesel, 1965 (Good)	5500
3020 diesel, 1965 (Fair)	3600*
3010, 1963 (Rough)	1500*
3010 diesel, 1962 (Fair)	2850*
M, 1948 (Fair)	325

OLIVER TRACTORS

1955 diesel, duals, 1973 (Good)	5775
1655 diesel, 1973 (Excellent)	5675
1250 diesel, 1966 (Good)	1900*
550 diesel, 1964 (Fair)	500
550 diesel, 1963 (Fair)	750*
Sup. 77 diesel, 1955 (Good)	350

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

Implement & Tractor IS IN NEED OF AN **ASSOCIATE EDITOR** who's just about as at home with a tractor as with a typewriter. On this job, the associate editor looks after our annual Farm Equipment Red Book, also does articles about the latest in farm equipment and farm practices with equipment implications. A degree on either the journalistic or the technical side is helpful, but what counts most is a demonstrable ability to write clearly, a solid familiarity with the tools of agriculture—and an abiding curiosity about what happens in the farm equipment industry, from the drawing board to the board room to the parts counter. Contact Director of Personnel, Intertec Publishing Corp., Box 12901, Overland Park, Kan. 66212, telephone 913/888-4664.

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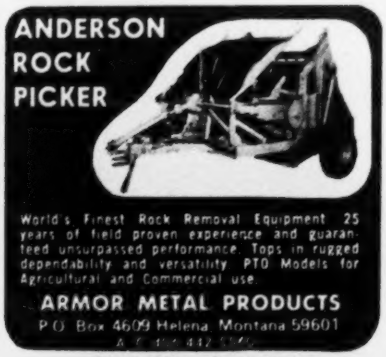

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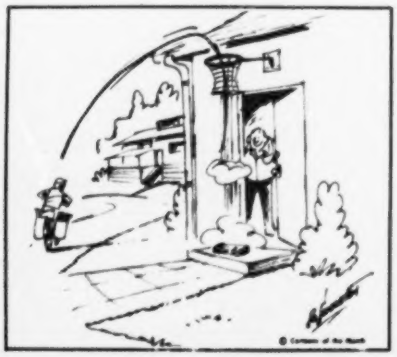

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Classified columns are not open to copy soliciting dealer or wholesaler distribution or for product promotion. Display space must be purchased for these purposes.

AUCTIONS
Used Farm Equipment

ALABAMA. Dothan (Houston County) located on the Montgomery Highway. Established in 1952. It has improved and expanded facilities and now holds sales twice a month. It is second in size determined by number of units moved. Annually this firm sells between 4,000 and 4,500 used farm tractors and 20,000 to 25,000 pieces of equipment each year. We have also increased our sales lot from 16 acres to 25 acres. Sales: January thru April, August thru October—2nd and 4th Tuesdays. May, November, December—2nd Tuesday only; June and July closed. Phone: area code 205/792-5314, 792-4914. JONES FARM EQUIPMENT CO.

INDIANA. Stilesville, 25 Mi. West of Indianapolis on U.S. 40. Fast growing—good market. Sales on 1st & 3rd Wednesdays and Thursdays of each month. Wednesdays—Equipment. Thursdays—Tractors, Combines, Cornheads and Industrial Equipment. Sale starts at 10:00 A.M. sharp. Jim Vaughn, **STILESVILLE IMPLEMENT AUCTION, INC. Amo (317) 539-4060** 5-7-77 tf

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December 15, 1979
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Implement&Tractor

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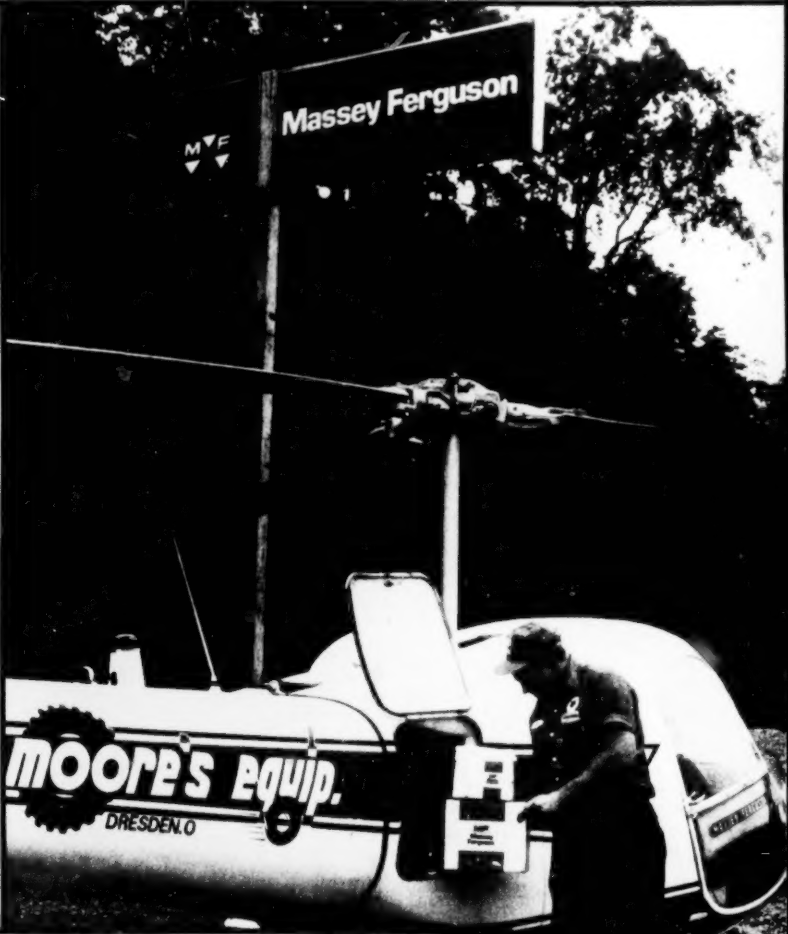
Dealers who use aircraft in their operations

page 16

More About Metrics page 42



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December 15, 1979 • Vol. 94 • No. 24

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

16: Dealers Who Use Aircraft In Their Operations. Air power may not be practical for every dealer, but if he can justify the expense, providing emergency parts and repair service by aircraft does wonders for a dealer's reputation with farmers.

24: Farm Equipment Wholesalers Assn. Among all the other business at their convention in Toronto—which included installing Sol White as president—FEWA's young executives took steps toward organizing their numbers and just about everybody found time to worry about the effects of rising interest rates.

30: Farm Equipment Manufacturers Assn. considers saving on business car expenses, strategic marketing, and keeping mind and body healthy, among other topics. George Schumacher takes command.

34: Agricultural & Industrial Manufacturers Representatives Assn. A wide-ranging convention program includes talks on hiring salesmen, improving communications with manufacturers, "hanging loose." New president is Don Cohoon.

42: Metric System, III—Measuring Mass, Pressure, Torque, Power and Force. How to turn pascals, newtons, atmospheres—metric terms—into good English, and vice versa.

44: Canadian Retail Sales Outlook for 1980. It looks, on balance, to be fair enough. Interesting data about sales of front-wheel-assist tractors and on smaller imports.

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what's ahead...

I&T
SINCE 1886

December 15, 1979

FORECASTING INDUSTRIAL EQUIPMENT SALES FOR 1980, the Industrial & Construction Equipment Div. of the Farm & Industrial Equipment Institute is anticipating a tough year for North America. Here's how the group summarized its 1980 outlook at its San Diego convention in December:

Product	Per Cent Change from 1979 United States	Canada
Rough-Terrain Forklifts	- 1.0	+ 1.5
Skid-Steer Loaders	+ 0.9	+ 2.4
Wheel-Log Skidders, 4WD, articulated	- 9.9	- 7.0
4WD Shovel Loaders	- 7.0	+ 3.6
Crawler Tractors under 90 horsepower	- 9.7	+ 0.5
Crawler Tractors over 90 horsepower	- 6.6	- 2.9
Crawler Loaders under 90 horsepower	-13.2	- 9.5
Crawler Loaders over 90 horsepower	- 9.2	- 7.0
Conventional Scrapers	- 5.8	- 7.5
Elevating Scrapers	- 7.9	- 5.0
Industrial Wheel Tractors	- 4.1	- 1.0
Backhoes for Wheel & Crawler Tractors	- 4.9	- 2.4
Trenchers	+ 0.9	- 0.8
Motor Graders	- 5.7	- 0.3
Off-Highway Haulers	+ 0.5	+ 0.5

The ICED Outlook Summary was reported by Charles F. Reed, marketing vice-president, North America, Fiat-Allis Construction Machinery, Inc.

FARM EQUIPMENT RETAIL SALES THROUGH OCTOBER continued to show increases over those of 1978's first 10 months in most categories, according to the Farm & Industrial Equipment Institute's flash report.

Unit Retail Sales

	October			January-October		
Equipment	1979	1978	Pct. Change	1979	1978	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-100 hp	7,512	7,292	+ 3.0	58,794	57,746	+ 1.8
Over 100 hp	8,457	9,822	-13.9	56,070	56,383	- 0.6
Total 2-wheel drive	15,969	17,114	- 6.7	114,864	114,129	+ 0.6
4-wheel drive	1,721	1,422	+21.0	9,649	7,467	+29.2
Total tractors	17,690	18,536	- 4.6	124,513	121,596	+ 2.4
S-P Combines	8,646	8,614	+ 0.4	28,991	28,240	+ 2.7
Balers*	1,728	1,376	+25.6	18,130	20,259	-10.5
Forage Harvesters**	3,377	2,902	+16.4	11,120	10,308	+ 7.9
Mower-Conditioners	2,171	1,440	+50.8	24,588	24,076	+ 2.1

*Bales under 200 lbs. **Shear-bar type

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RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative Jan.-Aug., 1978				Cumulative for Jan.-Aug., 1979			
	Aug. 1978		Aug. 1979		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	122	75	122	39	2,029	41	2,070	626	1,945	31	1,976	442
Alaska	1	4	2	1	16	.....	16	33	11	.....	11	26
Arizona	37	56	40	52	501	40	541	431	451	59	510	455
Arkansas	159	59	197	52	2,532	202	2,734	654	2,592	167	2,759	481
California	321	271	328	299	2,822	177	2,999	2,456	3,090	228	3,318	2,566
Colorado	76	48	90	42	640	71	711	517	706	129	835	463
Connecticut	16	22	12	18	124	3	127	240	136	.....	136	185
Delaware	9	7	9	3	124	11	135	62	165	12	177	39
Florida	180	131	167	119	1,451	44	1,495	1,083	1,441	49	1,490	1,205
Georgia	201	86	154	83	2,927	43	2,970	634	2,719	27	2,746	650
Hawaii	4	17	3	7	55	3	58	56	39	4	43	68
Idaho	61	16	65	17	727	84	811	190	689	106	795	139
Illinois	361	175	367	106	5,188	484	5,672	1,415	4,659	505	5,164	1,165
Indiana	193	86	182	50	3,442	291	3,733	929	2,892	303	3,195	648
Iowa	381	49	398	26	5,704	269	5,973	383	6,227	382	6,609	319
Kansas	301	31	530	31	2,459	330	2,789	287	2,893	458	3,351	267
Kentucky	213	94	193	60	3,475	71	3,546	753	3,238	61	3,299	583
Louisiana	158	87	124	60	1,752	146	1,898	854	1,714	109	1,823	624
Maine	23	17	20	9	168	.....	168	102	155	1	156	103
Maryland	35	44	44	29	532	18	550	448	579	25	604	354
Massachusetts	14	35	9	38	98	.....	98	316	105	.....	105	246
Michigan	164	99	134	67	2,173	165	2,338	975	1,933	164	2,097	955
Minnesota	363	61	390	54	4,006	320	4,326	424	4,245	635	4,880	527
Mississippi	185	51	179	37	2,466	121	2,587	581	2,445	87	2,532	466
Missouri	252	87	318	64	3,355	153	3,508	770	3,763	177	3,940	672
Montana	99	11	99	11	535	259	794	151	653	335	988	132
Nebraska	193	37	270	16	2,700	152	2,852	225	3,193	221	3,414	195
Nevada	6	12	10	15	60	.....	60	152	96	4	100	136
New Hampshire	8	6	9	8	97	.....	97	102	91	1	92	81
New Jersey	15	60	20	62	255	5	260	495	229	5	234	500
New Mexico	32	32	40	39	307	17	324	286	340	20	360	221
New York	141	120	165	61	1,804	63	1,867	1,069	1,788	72	1,860	789
North Carolina	177	91	108	45	2,948	38	2,986	789	2,819	49	2,868	677
North Dakota	219	29	215	16	1,716	536	2,252	201	1,755	858	2,613	166
Ohio	252	147	236	142	3,893	230	4,123	1,426	3,132	233	3,365	1,236
Oklahoma	262	69	421	72	2,039	168	2,207	617	2,438	319	2,757	523
Oregon	104	60	124	37	912	46	958	405	860	55	915	391
Pennsylvania	143	117	140	115	1,904	22	1,926	1,320	1,665	28	1,693	1,018
Rhode Island	5	7	1	3	18	.....	18	43	16	.....	16	30
South Carolina	74	53	62	47	1,318	19	1,337	421	1,331	28	1,359	348
South Dakota	167	9	165	9	1,648	165	1,813	135	1,689	231	1,920	141
Tennessee	237	93	170	71	3,300	57	3,357	784	2,926	52	2,978	677
Texas	663	303	902	369	5,781	240	6,021	3,048	6,827	364	7,191	2,911
Utah	44	39	50	29	434	10	444	326	459	11	470	312
Vermont	26	12	21	5	242	1	243	57	247	6	253	54
Virginia	162	104	134	39	1,684	9	1,693	746	1,745	7	1,752	507
Washington	160	85	140	69	1,047	115	1,162	690	1,126	135	1,261	625
West Virginia	44	35	45	40	421	.....	421	261	421	.....	421	185
Wisconsin	256	55	320	44	3,605	90	3,695	548	4,120	152	4,272	537
Wyoming	21	20	33	19	249	14	263	144	304	25	329	176
U.S. Government	1	12	46	42	42	3	45	575	105	.....	105	502
Miscellaneous‡	.....	.....	.....	129	61	2	63	1,060	43	3	46	1,047
TOTAL	7,341	3,328	8,021	2,917	87,788	5,346	93,134	31,295	89,250	6,933	96,183	27,766

Data released November 5, 1979, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; Hy-Dynamics; International Harvester; JCB Excavators; K-D Mfg.; Long; Massey-Ferguson; Pettibone; R. M. Wade (Satoh); Steiger; Versatile; White; and Woods & Copeland.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

BILL ENLOW TRACTOR SALES
Tulsa, Okla.
(November 8, 1979

ALLIS-CHALMERS TRACTORS

D-17 diesel, 1958 (Rough)	1000

CASE TRACTORS

430, ldr., 1966 (Good)	3500
930 LP, 1964 (Good)	2900*
530, backhoe, 1963 (Good)	3975
580, backhoe, 1967 (Good)	4400

DEUTZ TRACTOR

90/06 diesel, (Good)	2900

FORD TRACTORS

9N, 1940 (Fair)	800
9N, 1941 (Fair)	800
9N, 1943 (Good)	1100
9N, 1944 (Good)	1050
9N, 1944 (Good)	1050
9N, 1945 (Fair)	850
9N, 1945 (Fair)	950*
9N, 1945 (Good)	1275
9N, 1946 (Good)	975
8N, 1947 (Good)	1350*
8N, 1947 (Good)	1250*
8N, 1948 (Fair)	1050
8N, 1948 (Fair)	900*
8N, 1948 (Good)	1100*
8N, 1949 (Fair)	930*
8N, 1949 (Good)	1150
8N, 1949 (Good)	1375
8N, 1949 (Good)	1275
8N, 1950 (Good)	1400
8N, 1950 (Good)	1350
8N, 1951 (Good)	1275
8N, 1951 (Good)	1500*
8N, 1952 (Good)	1400
8N, 1952 (Good)	1300
8N, 1952 (Good)	1400
8N, 1952 (Good)	1260
NAA, 1953 (Good)	1725
NAA, 1953 (Good)	1825
NAA, 1953 (Good)	1750*
Dexta, 1962 (Good)	1400
600, 1955 (Good)	2050
800, 1955 (Good)	2100
601, 1958 (Good)	2200*
801, 1957 (Good)	2000
801, ldr., 1961 (Good)	2850
861, 1961 (Good)	2400*
2000, 1965 (Good)	2600
2000, 1973 (Good)	3650*
3000 diesel, 1968 (Good)	3200
3000, 1969 (Good)	3300
3400, ldr., 1966 (Good)	3350
3600, 1977 (Excellent)	6750
4000, 1963 (Fair)	1550*
4000 diesel, 1967 (Good)	3350
4000 diesel, 1968 (Good)	3400*
4000 diesel, 1969 (Good)	3550*
4000 diesel, 1969 (Fair)	2875
4000 diesel, 1971 (Good)	3950
4000 diesel, ldr., 1972 (Good)	4900
5000 diesel, 1968 (Good)	3900
5000 diesel, 1970 (Good)	4700
5000 diesel, 1971 (Good)	4650
5000 diesel, 1973 (Good)	5675
335 diesel, trencher, 1979 (New)	14,000*

INTERNATIONAL HARVESTER TRACTORS

Cub, 1948 (Good)	1070
Cub Loboy, 1968 (Good)	1950*
Cub 154, 1969 (Fair)	1700
Cub 154, ldr., 1969 (Good)	2600
C, 1950 (Good)	455
400 LP, 1955 (Good)	1300*
424 diesel, 1965 (Good)	2750
460, 1961 (Fair)	1100*
706 diesel, 1966 (Good)	4925
806 diesel, 1965 (Good)	4700*
1086 diesel, cab, duals, 1976 (Good)	16,500
2424, 1968 (Fair)	1100
4100 diesel, 4-W-D, cab, 1967 (Fair)	4200*

JOHN DEERE TRACTORS

H, 1944 (Good)	450
70, 1955 (Good)	825
420, 1957 (Good)	1200
2010, 1963 (Good)	1820*
2010, 1964 (Good)	1900*
3010 diesel, 1961 (Good)	3400*
3010 diesel, 1963 (Good)	4400
4010 LP, 1962 (Good)	3500
2020, 1968 (Good)	3000*
2020 diesel, 1969 (Good)	3925
3020 diesel, 1970 (Good)	5750

FERGUSON TRACTORS

30, 1952 (Good)	1100
30, 1953 (Good)	1050

MASSEY-HARRIS TRACTORS

555, 1948 (Fair)	300*
50, 1956 (Fair)	1350*
50, 1957 (Good)	1650

(*More...*)

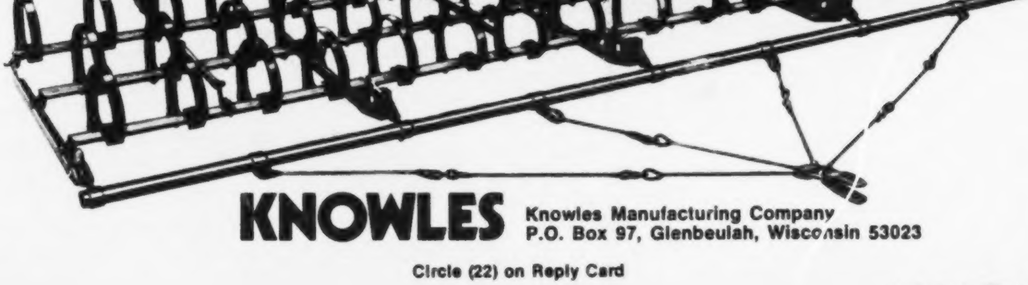
Fill out your line with this outstanding harrow...

- Tough 1" x 2" rectangular tooth bars
- Tempered spring teeth with bolt holes for replaceable points
- Solid 2" x 2" x ¼" angle steel frame
- Replaceable, high-carbon wear shoes
- High-carbon, tubular drawbar with heavy links and draft-adjusting plates
- Adjustable hitch and depth control levers

KNOWLES SPRING TOOTH HARROW

Show your prospect the rugged quality of a KNOWLES Spring Tooth Harrow, then if he wants to shop around, encourage it. Let him compare it detail-for-detail with any other unit available. He'll be back.

Write for details of KNOWLES attractive distributor plan.



KNOWLES Knowles Manufacturing Company
P.O. Box 97, Glenbeulah, Wisconsin 53023

Circle (22) on Reply Card

Auctions

(continued)

MASSEY-FERGUSON TRACTORS

35, 1959 (Good)	1675
35, 1960 (Fair)	1400*
35, 1960 (Fair)	1650
35 diesel, 1961 (Fair)	1500*
35 diesel, 1962 (Good)	2125
35 diesel, 1962 (Good)	2300
35 diesel, 1962 (Good)	2400
35, 1963 (Good)	2250
50, 1958 (Fair)	1475
50, 1960 (Good)	1690*
50, 1961 (Fair)	1550
50, 1961 (Good)	1600*
50 diesel, 1963 (Good)	2075
65 diesel, 1959 (Fair)	1800*
65 diesel, 1960 (Good)	2000
65 diesel, 1961 (Good)	1900
65, 1962 (Fair)	1650
65, 1962 (Good)	2000
65 diesel, 1962 (Good)	1950
65, 1963 (Good)	2050
65 diesel, 1963 (Good)	2200*
65 diesel, 1963 (Fair)	1850*
65 diesel, 1964 (Good)	2150*
65 diesel, 1964 (Good)	2500
65, ldr., 1964 (Good)	2750*
135, 1965 (Rough)	1675
135, 1966 (Good)	2825
135 diesel, 1966 (Good)	2950
135 diesel, 1967 (Fair)	2450
135 diesel, 1967 (Good)	3000
135, 1967 (Good)	2850
135 diesel, 1968 (Good)	2900*
135, 1968 (Good)	2700*
135, 1968 (Good)	2800
135 diesel, 1969 (Good)	3400
135 diesel, 1970 (Good)	3500
150, 1969 (Good)	3000*
150 diesel, 1973 (Excellent)	4250
165 diesel, 1971 (Good)	3750
165 diesel, 1973 (Good)	4000
175 diesel, 1968 (Fair)	3100*
175 diesel, 1972 (Good)	4450
180 diesel, 1969 (Good)	3700
230 diesel, 1979 (New)	6200
235 diesel, 1975 (Good)	4250*
245 diesel, 8 speed, 1980 (New)	7250
245 diesel, 1980 (New)	6750*
255 diesel, 1977 (Excellent)	6300
255 diesel, 1977 (Good)	5700
265 diesel, 1977 (Good)	7250*
1155 diesel, cab, 1977 (Good)	9750

MINNEAPOLIS-MOLINE TRACTORS

Jet Star diesel, ldr., 1960 (Good)	1950
Jet Star 3 diesel, 1967 (Good)	2500

OLIVER TRACTOR

1900 diesel, 1962 (Fair)	1700

SATOH TRACTOR

Beaver diesel, (Good)	2500*

YODER & FREY, INC.
Archbold, Ohio
(November 13, 1979)

ALLIS-CHALMERS TRACTORS

D19, 1962 (Good)	2575
D17, 1961 (Good)	2000*
D15, 1962 (Fair)	1400*
D12, 1961 (Fair)	900
WD45, 1952 (Rough)	510
WD, 1950 (Rough)	375*
WD, mo., 1947 (Fair)	350

DAVID BROWN TRACTORS

1210, 1974 (Good)	4400*
1200, 1968 (Fair)	3200*
1200, 1968 (Fair)	3000
990, 1972 (Good)	1750
990, (Rough)	850
885, duals, 1976 (Good)	5200*
880, (Rough)	700*

CASE TRACTORS

1270 diesel, 1971 (Rough)	8000*
1070 diesel,	9250
970 diesel, 1972 (Good)	5800*
930, 1967 (Good)	2750
930, 1967 (Fair)	2700*
580, backhoe, ldr., 1975 (Good)	7500*
530, backhoe, ldr., 1960 (Good)	3800*
500 diesel, 1950 (Rough)	1200
300, 1957 (Rough)	700*

JOHN DEERE TRACTORS

5020 diesel, 1968 (Good)	6400*
4520 diesel, 1972 (Good)	9000*
4020 diesel, 1968 (Excellent)	7700*
4020 diesel, 1968 (Good)	7100*
4020 diesel, 1966 (Good)	7400
4020 diesel, duals, 1965 (Fair)	6700*
4020 diesel, 1964 (Good)	6150
4020 diesel, 1964 (Good)	5100
4010, 1963 (Good)	4500
3020 diesel, 1967 (Good)	6750
2020, 1967 (Good)	3800
2010, ldr., 1964 (Good)	2500
1020, ldr., 1970 (Good)	4000
730, 1959 (Fair)	1700
730, 1959 (Fair)	1425
720 diesel, 1958 (Fair)	1175
620, 1957 (Good)	1550
420, 1956 (Good)	1775
70, 1954 (Fair)	1325
60, 1954 (Fair)	775
60, 1952 (Rough)	380
A, 1947 (Good)	450
A, 1945 (Rough)	300
H, cult.,	475
MT, 1900 (Rough)	340

FORD TRACTORS

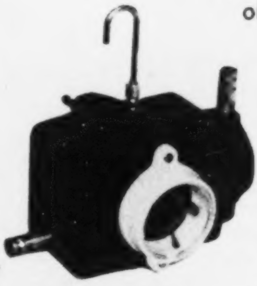
6000, 1961 (Fair)	1900*
5000, 1970 (Good)	4000*
5000, 1968 (Good)	3525
5000, 1968 (Good)	3300*
4000, 1974 (Good)	3825
4000, 1973 (Excellent)	5325
4000, 1971 (Fair)	3700
4000, ldr., 1961 (Good)	2000*
4000, 1961 (Rough)	1700*
4000, 1959 (Good)	1800*
2600, (New)	4800*
1600, mo., (New)	4200*
Jub., 1953 (Fair)	1025*
Maj., 1955 (Rough)	1000
860, 1957 (Fair)	1300*
700, 1955 (Good)	1425
640, 1957 (Fair)	1300*
8N, 1951 (Good)	1420
8N, 1950 (Good)	1200
8N, 1950 (Fair)	900
8N, 1949 (Rough)	800*
8N, 1947 (Rough)	575
9N, 1946 (Good)	1125
9N, 1946 (Fair)	935

INTERNATIONAL HARVESTER TRACTORS

2400, ldr., 1976 (Excellent)	6000*

(More...)

LR-900
Used as directed, the LR-900 will act as an engine protectant, by monitoring oil levels and adding oil when needed automatically!
CAUTION: Extensive use of Murphy Products may be habit forming.



HEADACHE RELIEF
for Engine Operators

Murphy laboratories developed the LR-900 to provide fast relief for headache pain caused by daily oil check ups and mechanical failure resulting from insufficient crankcase levels. When set at the factory recommended oil level height, the **MURPHYMATIC®** LR-900 monitors crankcase lube oil level and automatically adds the proper amount prescribed by the engine manufacturer.

If something should go wrong, such as loss of oil supply, the LR-900 shuts down the engine and/or actuates an alarm.

MURPHYMATIC® LR-900 is safe to use on larger engines, too! A 1/4 inch inlet port allows for rapid refilling after an oil change. One gallon of 40-weight oil can be metered in six minutes due to the new "thumb valve metering design".

Take **MURPHYMATIC®** LR-900 and stop worrying about engine lube oil levels.

Use only as directed and remember to follow installation instructions. If severe engine problems persist, consult your engine specialist.

Also available in explosion proof model (LR-900 EX). Write or call for complete information on the LR-900.

FRANK W. murphy MFR., INC.

ENGINEERING NEW ANGLES TO EQUIPMENT MONITORING AND CONTROL

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MURPHY SOUTHERN DIVISION P.O. Box 36838, Houston, Texas 77036 713/666-4393
MURPHY SAFETY SWITCH OF CALIFORNIA P.O. Box 788, Palmdale, California 93550 805/947-7108
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MURPHEK PTY. LTD. Paramatta Rd & Skarrat, Auburn, N.W.S. Australia 648-1203

Circle (24) on Reply Card

Auctions
(continued)

1566 diesel, 1975 (Good)	11,000*
1466 diesel, 1973 (Excellent)	11,750*
1456 diesel, 1970 (Good)	8000*
1256 diesel, 1972 (Good)	7500*
1206 diesel, 1967 (Good)	6450
1066 diesel, 1976 (Good)	9700*
1066 diesel, 1975 (Good)	9300
856 diesel, 1970 (Excellent)	8300*
826, duals, 1971 (Good)	7200*
806, 1964 (Good)	5900
806, 1964 (Fair)	3800
806, 1963 (Rough)	3000*
706, 1964 (Fair)	3000*
606, (Rough)	1000*
560, 1960 (Good)	1950
560, 1959 (Fair)	1800*
450 diesel, 1957 (Fair)	1150
B414, ldr., 1964 (Good)	2350
B414, 1964 (Good)	1850
400, 1964 (Rough	1550
400, 1964 (Rough)	1000
300, ldr., (Rough)	550
200,	1225
Sup. MTA, 1954 (Good)	1100*
Sup. M, 1952 (Fair)	775*
M, 1951 (Good)	875*
M, 1950 (Good)	830
M, 1950 (Fair)	650*
H, 1946 (Rough)	375
H, 1946 (Rough)	325
Sup. C, cult., 1953 (Good)	710
Sup. C, cult., 1950 (Good)	700

MASSEY-FERGUSON TRACTORS

3165, ldr., 1968 (Good)	3500
1100 diesel, 1966 (Good)	5550*
245, (New)	6900*
180, 1967 (Good)	3600
180, 1966 (Rough)	2800*
175 diesel, 1969 (Good)	3500
165, 1971 (Good)	3450
165, 1965 (Fair)	2775
150, 1965 (Good)	3000
135, 1974 (Excellent)	4175
65, ldr., 1963 (Fair)	2600
65, 1963 (Rough)	1650
65, 1962 (Good)	2325
35, 1959 (Good)	2400

MINNEAPOLIS-MOLINE TRACTORS

U, (Rough)	300*
ZA, 1948 (Rough)	290

OLIVER TRACTORS

2050, 1970 (Fair)	6000*
880 diesel, 1958 (Good)	1300
77, (Fair)	340
66, ldr., 1954 (Good)	825*

WHITE TRACTORS

4-150 diesel, 4-W-D, 1975 (Excellent)	18,500

NOTES
Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

New for 1980
New from KING GOOSE

Optional Expanding Sides with Finger Tip Controls

KGA 12 SUPER KING GOOSE COMBINE TRAILER
New heavier duty axle, suspension system and heavier main frame result in a hard working combine trailer capable of hauling up to 24,000 lbs. payload. Optional hydraulic expanding sides increase width from 8' to 12' with the touch of a button. GVWR 30,000 lbs. (approx.)

KING GOOSE STRAWBOSS
Now two capacities to choose from: STRAWBOSS I - 36,000 lb. GVWR or STRAWBOSS II - 46,000 lb. GVWR. More versatile than ever, the Strawboss is the perfect answer to your combine or other large equipment hauling. Now Strawboss I or II is available with optional hydraulic power controls to extend or retract sides.

KING GOOSE

MANUFACTURED BY
KALYN COMPANY
HWY 84 WEST • GATESVILLE, TX 76528
CALL TOLL FREE 800 433 5521
(In Texas 800 772-5930)

Circle (26) on Reply Card

1980 in Canada looks OK

■OUTLOOK for 1980 retail sales of farm equipment in Canada appears to be fairly solid, with expectations of slight declines in unit volume in some items offset by increases in others, as well as by increases in unit sizes.

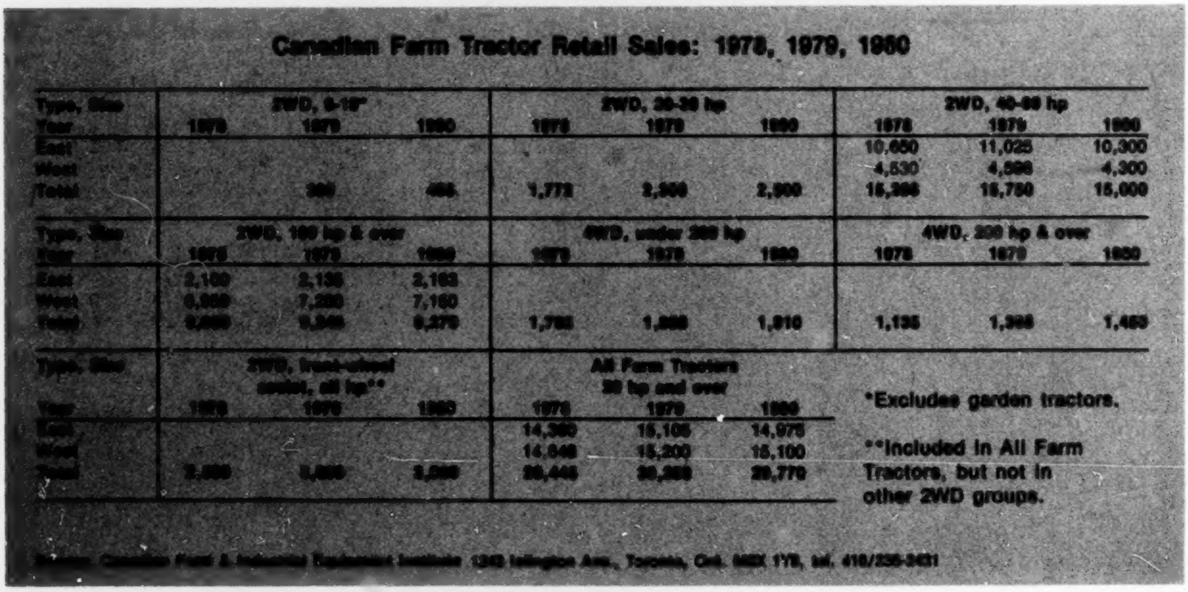
Canada's forecast, delivered at the annual convention of the Canadian Farm & Industrial Equipment Institute Nov. 13 in Toronto is a consensus effort by member firms of the group. Tractor sales and outlook information is provided in the accompanying box and provides details about smaller imports and front-wheel-assist units, not available in U.S. forecasts. Other information in the CFIEI outlook:

Product	1978 (actual)	1979 (est.)	1980 (forecast)
S-P combines			
East	1,050	1,068	1,075
West	3,829	3,747	3,625
Total	4,880	4,800	4,675
Corn heads	860	875	862
P-T combines	3,020	3,000	2,800
S-P swathers			
East	400	380	400
West	3,625	3,750	4,212
Total	4,000	4,050	4,600
P-T swathers	2,925	3,100	3,100
Balers (small)			
East	2,477	2,400	2,300
West	2,375	2,200	2,100
National	4,806	4,500	4,250
Balers (big)			
East	200	250	300
West	2,575	3,050	3,225
National	2,800	3,325	3,500
Forage harvesters	1,705	1,650	1,800
Mower-conditioners	4,400	4,800	5,000

Product	1978 (actual)	1979 (est.)	1980 (forecast)
Diskers	2,250	2,631	2,700
Chisel plows	5,160	5,063	5,275
Moldboard plows			
East	5,400	5,338	5,250
West	1,100	1,025	1,043
National	6,488	6,188	6,000
Disk harrows			
East	3,433	3,400	3,185
West	3,400	3,050	3,180
National	6,840	6,400	6,385
Grain drills			
East	1,650	1,650	1,600
West	6,470	6,125	6,125
National	8,175	7,550	7,550
Corn planters	1,825	1,850	2,000
Manure spreaders			
East	3,513	3,400	3,462
West	1,115	1,000	1,000
National	4,550	4,300	4,400
Grinder-mixers	2,150	2,100	2,100

CFIEI's new leadership

New president of CFIEI is E. W. Stahl (Deere), succeeding E. E. Johnson (Case), who becomes board chairman. Other officers are P. M. Soubry (Versatile), first vice-president; C. J. Munro (Int. Harvester), second vice-president; and A. R. Thomson (Deere), treasurer. Executive director is Brent Hambre. CFIEI is headquartered at 1243 Islington Ave., Toronto, Ont. M8X 1Y9, telephone 416/236-2431.



Canadian Farm Tractor Retail Sales: 1978, 1979, 1980

Type, Size	2WD, 0-19*			2WD, 20-39 hp			2WD, 40-99 hp		
Year	1978	1979	1980	1978	1979	1980	1978	1979	1980
East							10,650	11,025	10,300
West							4,530	4,698	4,300
Total		300	400	1,773	2,900	2,900	15,388	15,750	15,000

Type, Size	2WD, 100 hp & over			4WD, under 200 hp			4WD, 200 hp & over		
Year	1978	1979	1980	1978	1979	1980	1978	1979	1980
East	2,100	2,135	2,163						
West	6,960	7,200	7,160						
Total	9,060	9,340	9,275	1,785	1,898	1,810	1,135	1,398	1,460

Type, Size	2WD, front-wheel assist, all hp**			All Farm Tractors 20 hp and over		
Year	1978	1979	1980	1978	1979	1980
East				14,390	15,105	14,975
West				14,046	15,200	15,100
Total	2,500	3,000	3,000	28,446	30,288	29,770

*Excludes garden tractors.

**Included in All Farm Tractors, but not in other 2WD groups.

Source: Canadian Farm & Industrial Equipment Institute 1243 Islington Ave., Toronto, Ont. M8X 1Y9, tel. 416/236-2431

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-Aug., 1978 and 1979 (1)

(In Units)

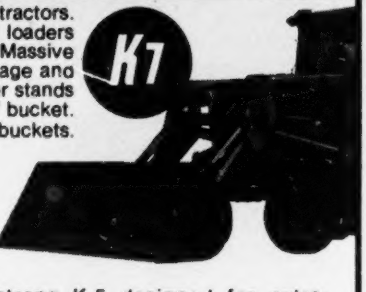
	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled Power Units		Windrowers Self-Propelled Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979
Alabama	224	165	79	60	317	178	1	1	1	1	119	154	43	37
Alaska	.....	.....	.....	.....	6	4	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	37	19	5	.....	22	27	47	46	51	49	6	4	7	11
Arkansas	455	295	3	7	453	344	2	2	1	1	44	43	10	14
California	137	118	25	26	160	151	221	194	241	218	3	11	40	38
Colorado	172	219	33	48	324	361	201	216	205	221	29	51	56	50
Connecticut	.....	1	.....	.....	60	57	1	.....	1	.....	1	2	10	15
Delaware	15	16	8	12	31	14	3	.....	3	.....	2	9	8	5
Florida	88	55	56	44	98	61	.....	2	.....	2	29	49	20	14
Georgia	382	328	293	274	287	183	5	1	5	1	288	387	97	91
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	.....
Idaho	214	204	5	3	393	369	224	275	236	277	13	26	39	26
Illinois	1,437	1,526	1,210	1,218	348	325	23	15	28	15	460	493	165	181
Indiana	895	791	751	667	394	337	6	8	5	8	373	453	102	119
Iowa	1,276	1,398	1,138	1,134	413	368	220	228	224	220	1,116	1,609	459	467
Kansas	1,063	1,207	116	113	356	407	283	340	291	348	173	262	117	141
Kentucky	206	212	146	110	581	383	4	3	4	4	215	243	93	88
Louisiana	308	270	4	1	116	114	.....	.....	.....	.....	11	12	21	9
Maine	4	1	.....	.....	69	71	.....	3	.....	3	.....	1	19	24
Maryland	56	54	56	35	134	107	9	7	9	6	31	38	35	44
Massachusetts	.....	.....	.....	.....	50	41	1	1	1	.....	3	1	9	10
Michigan	271	253	204	157	468	349	55	59	56	61	177	196	176	246
Minnesota	1,033	954	538	606	890	746	699	593	723	607	423	725	511	592
Mississippi	240	262	9	3	185	146	.....	.....	.....	.....	45	39	49	46
Missouri	479	562	220	229	670	556	80	70	83	70	319	496	79	117
Montana	308	235	1	4	379	329	458	397	500	418	35	56	28	23
Nebraska	765	676	433	376	222	201	387	429	404	440	283	487	189	191
Nevada	3	1	.....	.....	39	39	53	62	57	65	1	1	3	2
New Hampshire	.....	.....	.....	.....	39	41	1	.....	1	.....	.....	2	13	15
New Jersey	22	17	11	8	66	51	2	.....	2	.....	10	11	15	7
New Mexico	12	16	7	5	137	115	81	77	79	77	11	18	5	4
New York	72	77	74	75	595	621	48	55	49	55	130	89	315	338
North Carolina	174	244	152	171	479	265	2	3	2	3	140	175	54	49
North Dakota	812	826	9	14	130	74	910	745	950	796	68	145	63	58
Ohio	697	700	522	504	739	559	9	10	8	10	349	404	139	150
Oklahoma	330	384	5	5	645	773	129	144	133	147	69	117	25	35
Oregon	176	145	4	.....	318	248	262	174	276	175	12	26	58	47
Pennsylvania	115	134	87	86	876	765	61	67	61	66	214	244	253	308
Rhode Island	.....	.....	.....	.....	5	3	.....	.....	.....	.....	.....	1	.....	.....
South Carolina	154	163	98	83	149	82	.....	.....	.....	.....	57	92	28	24
South Dakota	462	360	129	126	232	144	710	669	746	713	196	298	161	169
Tennessee	217	216	78	56	715	513	2	.....	2	.....	143	196	119	99
Texas	658	644	175	173	1,022	1,150	82	97	88	105	128	186	29	51
Utah	32	33	.....	1	257	248	117	113	118	114	34	57	43	35
Vermont	.....	.....	1	.....	102	99	1	.....	1	.....	1	2	52	67
Virginia	92	92	66	81	517	417	8	6	8	6	101	125	111	91
Washington	242	284	9	28	290	238	148	157	153	165	14	17	69	62
West Virginia	2	2	1	3	332	224	.....	.....	.....	.....	19	20	20	14
Wisconsin	201	174	189	170	1,550	1,520	250	305	252	305	336	481	1,118	1,268
Wyoming	36	29	5	2	178	168	138	129	146	137	15	20	10	14
U.S. Government	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....
TOTAL	**14,575**	**14,363**	**6,955**	**6,718**	**16,848**	**14,586**	**5,948**	**5,703**	**6,204**	**5,909**	**6,248**	**8,580**	**5,086**	**5,506**

Data released November 5, 1979, Farm & Industrial Equipment Institute.

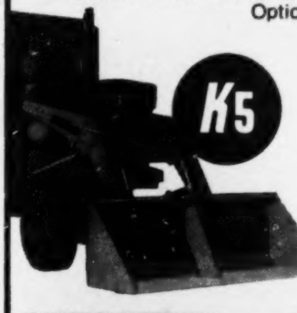
(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types 1978	1979	Manure Spreaders Conveyor-Type 1978	1979	
240	187	19	11	........Alabama
1	1	1	1	..........Alaska
2	4	5	6	.........Arizona
455	478	79	87	........Arkansas
46	39	46	57	........California
104	127	31	54	........Colorado
77	70	61	63	.....Connecticut
20	14	45	54	........Delaware
82	67	17	26	..........Florida
282	218	26	40	.........Georgia
.....	1	.....	1	..........Hawaii
112	92	95	81	...........Idaho
655	593	897	770	..........Illinois
601	553	596	547	..........Indiana
1,288	1,185	1,835	1,950	............Iowa
602	820	164	211	..........Kansas
1,068	1,023	259	266	........Kentucky
90	91	18	22	........Louisiana
79	99	91	95	...........Maine
138	133	201	169	........Maryland
63	59	52	50	...Massachusetts
725	585	611	610	........Michigan
1,084	1,201	1,253	1,417	.......Minnesota
162	145	21	27	......Mississippi
1,433	1,448	314	366	........Missouri
114	100	48	41	........Montana
398	504	353	440	........Nebraska
2	10	2	2	..........Nevada
61	50	46	43	..New Hampshire
76	62	42	48	......New Jersey
26	24	3	5	.....New Mexico
827	937	1,186	1,066	........New York
419	318	143	126	...North Carolina
116	161	138	87	....North Dakota
1,068	870	797	813	............Ohio
618	794	23	25	.......Oklahoma
215	150	71	88	..........Oregon
1,002	906	1,044	1,031	.....Pennsylvania
6	6	3	1	....Rhode Island
148	114	23	28	...South Carolina
105	128	218	276	....South Dakota
822	785	131	146	.......Tennessee
1,043	1,245	94	115	...........Texas
149	140	117	74	............Utah
173	180	201	207	.........Vermont
581	626	196	180	.........Virginia
157	126	85	105	......Washington
205	192	72	72	....West Virginia
2,321	2,419	2,009	2,258	.......Wisconsin
140	47	43	44	........Wyoming
.....	.....	.....	.....	.U.S. Government
.....	.....	1	1	...Miscellaneous
20,201	20,127	13,826	14,303	........TOTAL

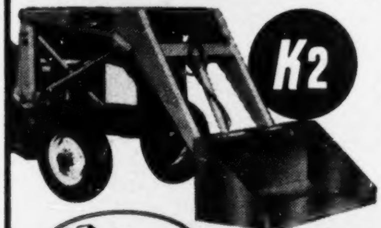
TURN FAST PROFITS WITH THIS COMPLETE LINE OF KOYKER FAST-ATTACHING LOADERS



Big, super-rugged K-7 for 110 plus HP tractors. Combines best features of industrial loaders into high-performance farm loader. Massive main frame knee for unmatched leverage and strength. Top operator visibility. Loader stands located in main frame. Standard HD 7' bucket. Optional 8' and 9' buckets.



Super-strong K-5 designed for extra-strength and stamina. Fits most tractors with cabs. Has big 18" deep main frame knee and massive 3-point wrap-around sub-frame. Rugged . . . almost one ton of steel. Big 7' twin-cylinder bucket standard. (Optional 5' and 8' buckets available.)



K-2 . . . the "work-horse" for tractors up to 60HP . . . fits most tractors with cabs. Has strength and stamina to handle toughest loading and moving jobs around the farm. Low-profile, compact. Accessories include twin-cylinder bucket, snow scoop extension, grapple fork.

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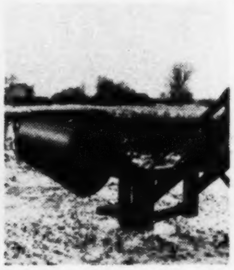
ROTADIGGER accommodates augers 4" through 36" diameter. Infinite speeds in either direction. Instant reversing.



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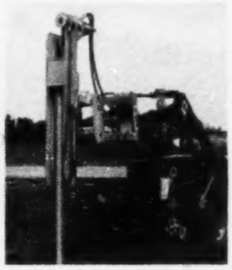

ROTADRIVER sets steel or wooden posts faster, with less effort. Operator determines impact force of 257 ft. weight.

Note economy of common mounting bracket.

For most farm or utility vehicles with hydraulic capacity. No PTO shaft. Mountings for front-end loaders, utility loaders, backhoe, and three-point hitch (Cat. I, II, III). Also check into the standard line of McMillen Hydraulic Augers. Two series in six models to 27 H.P.

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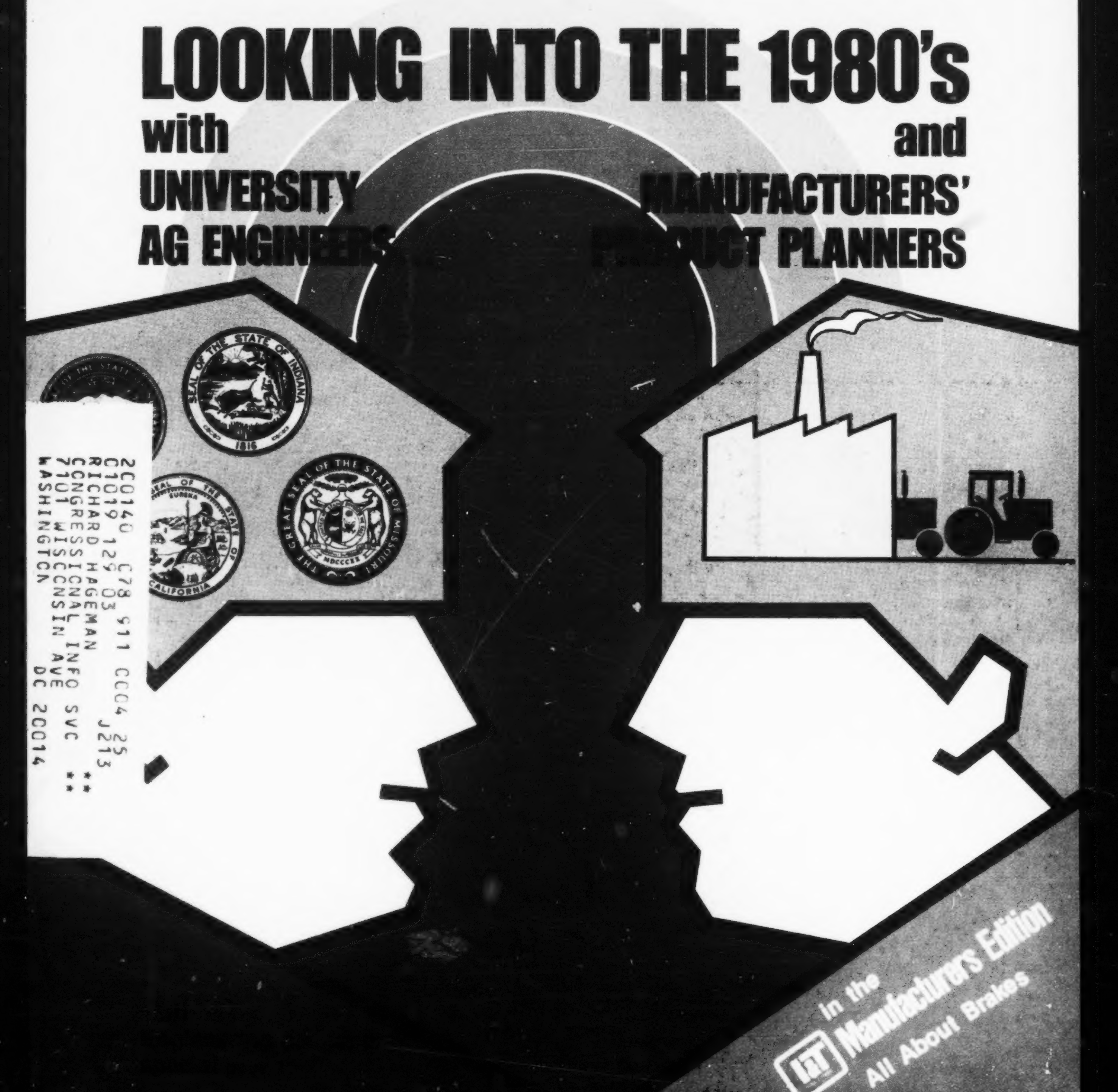

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in the I&T Manufacturers Edition
All About Brakes

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Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

15th Engineering Concepts Edition

LOOKING AT THE 1980's

11: **Introduction.**

12: **Product Planners Proclaim, 'You Ain't Seen Nothing Yet!'** What directions can farm equipment design be expected to take in the next 10 years? Several manufacturer product planners discuss future probabilities and possibilities in terms of equipment size, power and weight versus speed, automatic guidance, the impact on machine design of larger farms and curtailed availability of traditional fuels, etc.

16: **University Ag Engineers Foresee New Requirements, New Constraints, New Opportunities.** Engineers in four ag engineering departments make educated prognostications for the 80's, on farm size, implement size, harvest and tillage changes, cropping patterns, fuel types and economy, other issues.

20: **Big-Tractor Debuts: M-F, A-C, White.** Meanwhile, back in the 70's, three big tractor companies brought three new 100-horsepower-plus models barrelling into the market at year's end.

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(November 13, 1979)

ALLIS-CHALMERS TRACTORS

I400, ldr., backhoe, 1967 (Good)	3200
200 diesel, 1973 (Good)	5700
185 diesel, 1971 (Good)	6300*
175 diesel, 1975 (Excellent)	7100*
D15, 1967 (Good)	1800*
D15, 1965 (Fair)	1150*
D10, 1961 (Fair)	875

CASE TRACTORS

930 diesel, 1967 (Fair)	2750
680 diesel, ldr., backhoe, 1969 (Fair)	3700*
530, ldr., 1962 (Fair)	1700*
530, ldr., backhoe, 1961 (Good)	2850
VAC, 1952 (Fair)	400*

DEUTZ TRACTORS

6006 diesel, 1974 (Good)	4200
5505 diesel, 1969 (Fair)	850*

MASSEY-FERGUSON TRACTORS

1130 diesel, 1969 (Good)	4400
1130 diesel, cab, 1968 (Good)	5200*
1105 diesel, duals, 1973 (Excellent)	8950
1100 diesel, 1970 (Good)	5500
1100 diesel, 1968 (Good)	5200
1100 diesel, 1967 (Fair)	4600
1085 diesel, 1976 (Excellent)	9600
1085 diesel, 1974 (Good)	6700
1080 diesel, 1972 (Good)	4200
1080 diesel, 1969 (Fair)	3300*
1080 diesel, 1969 (Good)	4200*
275 diesel, 1975 (Excellent)	7050
265 diesel, 1975 (Good)	7000*
255 diesel, 1975 (Good)	5000*
255 diesel, 1975 (Good)	5150
235 diesel, 1975 (Good)	4350*
235 diesel, 1975 (Fair)	2425
180 diesel, 1968 (Fair)	3100*
180 diesel, 1967 (Good)	3500*
180 diesel, 1967 (Good)	3500
175 diesel, 1973 (Fair)	3650
175 diesel, 1973 (Good)	4550*
175 diesel, 1970 (Fair)	3300*
175 diesel, 1968 (Fair)	3250
175 diesel, 1966 (Fair)	3150*
165 diesel, 1971 (Good)	7500
165 diesel, 1971 (Fair)	3075
165 diesel, 1966 (Good)	3300*
165 diesel, 1966 (Good)	3650
165 diesel, 1966 (Good)	3300*
165 diesel, 1966 (Fair)	2650*
150 diesel, 1967 (Excellent)	4000
150 diesel, 1965 (Good)	3300*
135 diesel, 1972 (Good)	3375
135 diesel, 1972 (Good)	3300*
135, 1967 (Fair)	2500
135 diesel, 1966 (Good)	2950
135 diesel, 1966 (Fair)	2950*
65 LP, 1964 (Fair)	1850
65 diesel, ldr., 1964 (Fair)	2200*
65 diesel, 1964 (Good)	2050
50, 1960 (Good)	1750*
40, 1956 (Good)	1975*
40 LP, 1956 (Fair)	1050
35, 1963 (Good)	2000
35 diesel, 1963 (Fair)	2075
35 diesel, 1962 (Rough)	1000
35 diesel, 1962 (Good)	2200
35 diesel, 1961 (Good)	2200*
35, 1956 (Good)	1950*
35, 1955 (Good)	1900*
35, 1955 (Fair)	1325
35, 1955 (Rough)	975
35, 1955 (Fair)	1300*
TO30, 1952 (Fair)	525
TO20, 1950 (Fair)	500

FORD-FERGUSON TRACTOR

9N, 1941 (Fair)	600*

FORD TRACTORS

8600 diesel duals, 1975 (Good)	6900
8600 diesel, 1974 (Good)	7400
5000 diesel, 1969 (Excellent)	6000
5000 diesel, 1968 (Good)	4300
5000 diesel, 1967 (Fair)	3900
4410 diesel, 1965 (Rough)	1375*
4000 diesel, 1965 (Fair)	2600
4000 diesel, Select-O-Speed, 1965 (Fair)	2000*
4000, 1963 (Fair)	1400*
4000, Select-O-Speed, 1963 (Rough)	775*
3500 diesel, 1971 (Fair)	2200*
3400 diesel, trencher, bld., 1973 (Good)	4200*
3400 diesel, ldr., 1966 (Fair)	2550*
3400 diesel, ldr., 1965 (Fair)	1750
3000 diesel, 1973 (Good)	4350
3000 diesel, 1972 (Fair)	2700
3000 diesel, 1971 (Good)	3175
3000 diesel, 1970 (Good)	3500*
3000 diesel, 1969 (Good)	3225*
3000 diesel, 1969 (Good)	3400
3000, 1968 (Good)	3200

3000, 1968 (Fair)	2550*
2000, 1966 (Fair)	2850*
2000, ldr., backhoe, 1963 (Rough)	1300
971 diesel, corn picker, Select-O-Speed, 1958	850*
871, Select-O-Speed, 1958 (Fair)	1100*
871 diesel, Select-O-Speed, 1958 (Fair)	1200
861, 1958 (Good)	2125
851 diesel, 1958 (Fair)	1350*
851, 1956 (Fair)	1425
850, 1956 (Good)	2150*
850, 1956 (Good)	2150*
850, 1956 (Fair)	1800
641, 1961 (Good)	2250
621, ldr., 1960 (Fair)	2175*
621, 1960 (Good)	2100*
NAA, 1954 (Good)	1850
NAA, 1954 (Good)	1800
NAA, 1954 (Good)	1950*
Jub., 1953 (Good)	1875*
Jub., 1953 (Good)	1900*
Jub., 1953 (Fair)	1400
Jub., 1953 (Good)	1725
8N, 1952 (Excellent)	1800
8N, 1950 (Good)	1350
8N, 1948 (Fair)	700
8N, 1948 (Fair)	850
8N, 1946 (Fair)	825
8N, 1946 (Fair)	850

INTERNATIONAL HARVESTER TRACTORS

2400 diesel, ldr., backhoe, 1971 (Good)	4100*
2400 diesel, ldr., 1971 (Fair)	3250
1256 diesel, cab, duals, 1968 (Good)	4350
1256 diesel, 1967 (Rough)	2300
664 diesel, 1972 (Good)	5300
574 diesel, 1972 (Fair)	4300
300, 1955 (Good)	675
Sup. H, 1953 (Excellent)	950
H, 1950 (Good)	375
Sup. A, cult., plt., 1949 (Good)	1650
Cub 154 Loboy, 1973 (Good)	1500
Cub 154 Loboy, mo., 1968 (Good)	1575
Cub, Loboy, mo., 1957 (Good)	1375
Cub, cult., 1948 (Fair)	1150
Cub, mo., 1948 (Fair)	1000

JOHN DEERE TRACTORS

4020 diesel, 1968 (Excellent)	7850
4010 diesel, 1962 (Fair)	3250
3020 diesel, 1966 (Fair)	3950*
3020 diesel, 1965 (Good)	5500
3020 diesel, 1964 (Good)	4400
3010 diesel, 1962 (Fair)	1975
2630 diesel, 1975 (Excellent)	7300
2240 diesel, 1976 (Good)	6750*
1530 diesel, 1974 (Good)	4400
1520 diesel, 1972 (Good)	4350
420, 1957 (Fair)	925
330, 1960 (Good)	1400*
A, 1949 (Fair)	375
B, 1940 (Fair)	165
MT, 1952 (Good)	600

LEYLAND TRACTORS

270 diesel, 1975 (Good)	1900*
154 diesel, 1974 (Good)	2500*

LONG TRACTORS

900 diesel, 1975 (Good)	3500
560 diesel, (Fair)	2000
560 diesel, (Good)	2600*
460 diesel, 1976 (Good)	3000
384 diesel, 1971 (Good)	2300
360 diesel, 1977 (Good)	3700*

MINNEAPOLIS-MOLINE TRACTOR

Jet Star 3 diesel, 1965 (Rough)	250

OLIVER TRACTORS

550 diesel, 1963 (Fair)	925
550 diesel, 1961 (Good)	2150

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

C 4725-1

January 31, 1980
FIVE DOLLARS

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Tractor and equipment specifications
Hydraulic components data
Nebraska test reports
Full contents page A2

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The Business Magazine of the Farm and Industrial Equipment Industry

64 th annual edition

Implement & Tractor

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The Nebraska Tractor Test Law

. **Purpose of the Law**—The Nebraska Tractor Test Law originated in 1919 for the purpose of verifying advertising claims on tractors offered for sale to Nebraska farmers.

Its position as the only independent test laboratory in the United States devoted to the evaluation of tractor performance proved of unique value to the industry. The Agricultural Tractor Test Code used in the Nebraska Tests was developed with the approval and assistance of the American Society of Agricultural Engineers and the Society of Automotive Engineers, and is revised and updated periodically as the need arises. The Test Code (ASAE S209.4 or SAE J708c) is published in the ASAE Yearbook and SAE Handbook.

. **Provisions of the Law**—Stated briefly, the Nebraska Tractor Test Law provides:

That a stock unit of each agricultural tractor model sold in Nebraska shall be tested and passed upon by a board of three engineers under the supervision and direction of the University of Nebraska. Each tractor must be certified as a stock model and will be equipped with the common power consuming accessories. An official representative of the manufacturer is present during the test to see that the performance meets company standards.

The Department of Agriculture shall deny to any manufacturer the right to do business in the State on complaint of two or more bona fide customers that the company has failed to maintain an adequate service station with a full supply of replacement parts within the state and within reasonable distance of customers.

The law further states that it shall be unlawful to publish excerpts from any official test in advertising material without publishing the entire report.

The provisions of the Nebraska Test Law do not apply to any tractor the engine of which develops less than 20 hrosepower; or to tractors manufactured, sold and used for heavy construction when identical units are not sold and used for agricultural purposes.

Explanation of Test Report

Individual copies of any test report, annual summary booklets or annual subscription (at $3.50) are available. For complete information write to **Department of Agricultural Engineering, University of Nebraska—Lincoln, Lincoln, Nebraska 68583.**

GENERAL CONDITIONS

Each tractor tested is certified by the manufacturer to be a stock model. Tractor is equipped with all common power consuming accessories (power steering, lift pump, alternator, etc.) normally sold. Accessories may be disconnected only when the means for disconnecting can be reached from operator's station. Ballast can be added if recommended by the manufacturer and in amounts allowed under warranty policy. Static tire loads and inflation pressures must conform to standards established by the Tire & Rim Association.

PREPARATION FOR TESTS

The crankcase is drained and refilled with a weighed amount of new oil conforming to specifications in the operator's manual. The operator's manual is also used in selecting the proper fuel and for routine lubrication and maintenance operations. A time clock is installed to record total running time. A 12-hour run-in period under varying drawbar load is made on the test track under the direction of the manufacturer's representative. Preliminary adjustments can be made at this time. Parts added or removed under this or later runs are noted on the test report.

The tractor is equipped with approximately the amount of added ballast to be used during the drawbar test runs.

PTO PERFORMANCE

All PTO tests are made by connecting tractor PTO shaft to a dynamometer. During a preliminary power take-off run, the manufacturer's representative may make fuel, injection (ignition) timing and governor control settings. These settings must be maintained for remainder of tests. PTO test area is maintained at approximately 75°F. and tests are only run at 28.7 in. Hg or higher barometric pressure at test sight (1100 ft. altitude). Standard diesel fuel is heated to operating temperature characteristic of fuel system under test and maintained at that temperature. Fuel operating temperature is listed in "REMARKS" portion of each test.

Maximum Power and Fuel Consumption. Maximum power is tested for two hours at rated engine speed. Fuel consumption in gallons per hour, lbs per hp hour and hp-hr per gallon are noted and recorded. If standard PTO speed differs from rated engine speed a second (one hour) test run is made at PTO Rated Speed and the results recorded.

Varying Power and Fuel Consumption. Six 20-minute tests are made at (1) 85% of dynamometer torque at maximum power, (2) minimum dynamometer torque, (3) ½ of the 85% torque, (4) maximum power, (5) ¼ of the 85% torque and (6) ¾ of the 85% torque. This test is designed to approximate the varying load a tractor is subjected to during normal operation, and the fuel consumption figures given on the "Average" (Av) line closely indicate expected fuel use. Crankshaft speed variations also give some indication of governor performance.

DRAWBAR PERFORMANCE

Drawbar tests for pneumatic tires are performed on a concrete test course containing two 500-foot straight level areas and two 180 degree turns with a minimum radius of 50 feet. All engine adjustments are the same as those used in power take-off tests. Tire pressures are set at proper level, weights are added or removed and the tractor front, rear and total weight are taken and recorded.

Varying Power and Fuel Consumption. Maximum drawbar performance tests and varying power tests are made in the gear selected by the manufacturer. Slip of drive wheels must not exceed 15%, safe stability limits of the tractor must not be exceeded and 20% of static front end weight must remain on front wheels throughout the test.

The drawbar pull is set in four different test runs as follows: (1) Maximum power in selected gear; (2) 75% of pull at maximum power (10 hour test); (3) 50% of pull at maximum power; and (4) 50% of pull at reduced engine speed. In the final (50%) run, load and ground speed are maintained at levels set in previous run but transmission is shifted to a higher travel speed and crankshaft speed is reduced.

Maximum power in Selected Gears. In this run all forward gears are tested between 15% drive wheel slip and 10 miles per hour. This represents a minor change from earlier tests in which six manufacturer selected gears were tested, one of which could exceed 8 mph.

Lugging Ability in Rated Gear. The first run in this test is made at 100% maximum pull in the gear selected by the manufacturer. In each succeeding run, drawbar load is increased to reduce ground speed 10%, then drawbar pull, horsepower and drive wheel slip is recorded. The test ends when ground speed is reduced by 50% or when equipment limitations halt the test.

SOUND MEASUREMENT

Sound is recorded during each of the Varying Power drawbar tests, as the tractor travels on a straight section of the course. The dB(A) sound level is obtained by a microphone located near the right ear of the operator. Bystander sound readings are taken 25 feet from side of tractor during maximum throttle.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

NEBRASKA TRACTOR TEST 1296—CASE 2290 MANUAL DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—998 rpm)								
128.80	2100	8.870	0.476	14.52	192	60	75	28.540
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
112.45	2158	8.040	0.495	13.99	190	60	75	......
0.00	2310	2.723	.....	.....	177	60	74	......
58.27	2241	5.282	0.627	11.03	183	60	74	......
129.26	2100	8.903	0.476	14.52	193	60	75	......
29.60	2274	3.981	0.930	7.44	180	60	76	......
86.38	2208	6.748	0.540	12.80	186	61	74	......
Av 69.33	**2215**	**5.946**	**0.593**	**11.66**	**185**	**60**	**75**	**28.537**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 5th (3L) Gear											
106.07	7489	5.31	2099	5.42	8.510	0.555	12.46	185	36	40	28.496
75% of Pull at Maximum Power—Ten Hours 5th (3L) Gear											
87.24	5791	5.65	2202	4.02	7.437	0.590	11.73	181	30	33	29.241
50% of Pull at Maximum Power—Two Hours 5th (3L) Gear											
60.06	3870	5.82	2238	2.77	5.963	0.687	10.07	181	40	44	28.855
50% of Pull at Reduced Engine Speed—Two Hours 6th (3H) Gear											
59.89	3857	5.82	1778	2.69	4.824	0.557	12.41	180	39	46	28.875
MAXIMUM POWER IN SELECTED GEARS											
82.69	12635	2.45	2191	14.99	2nd (1H) Gear			180	30	33	29.210
103.81	11813	3.30	2100	12.05	3rd (2L) Gear			184	35	38	28.500
108.76	9285	4.39	2100	6.78	4th (2H) Gear			185	36	39	28.490
109.36	7714	5.32	2100	5.30	5th (3L) Gear			185	36	40	28.490
108.57	6013	6.77	2099	4.17	6th (3H) Gear			185	35	37	28.500

LUGGING ABILITY IN RATED GEAR 5th (3L)						
Crankshaft Speed rpm	2100	1888	1682	1472	1255	1046
Pounds Pull	7714	8479	9166	9426	9398	8680
Increase in Pull %	0	10	19	22	22	13
Horsepower	109.36	107.35	102.70	92.01	78.30	60.62
Miles Per Hour	5.32	4.75	4.20	3.66	3.12	2.62
Slip of Drivers %	5.30	5.90	6.49	6.78	6.78	6.34

TRACTOR SOUND LEVEL WITHOUT CAB	**dB(A)**
Maximum Available Power 2 Hours	86.0
75% of Pull at Max. Power 10 Hours	85.5
50% of Pull at Reduced Engine Speed 2 Hours	84.5
Bystander in 8th (4H) gear	87.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 18.4-38; 8; 12	Four 18.4-38; 8; 12
Ballast	—Liquid (each)	1195 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 11.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	120 lb	None
Height of drawbar		19 in	19 in
Static weight with operator	—rear	11950 lb	9560 lb
	front	3450 lb	3210 lb
	total	15400 lb	12770 lb

Department of Agricultural Engineering
Dates of Test: November 7, 1978 to January 4, 1979

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 50.4 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8309 **Fuel weight** 6.918 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 4.245 gal **Drained from motor** 4.013 gal **Transmission and final drive lubricant** Case TFD fluid **Total time engine was operated** 41.5 hours

ENGINE **Make** Case Diesel **Type** 6 cylinder vertical with turbocharger **Serial No.** 10160542 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 15.75 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats

CHASSIS: **Type** standard with duals **Serial No.** 8836198 **Tread width** rear 60" to 124" front 60" to 88" **Wheel base** 104" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.3" Vertical distance above roadway 38.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 2.2 second 2.7 third 3.7 fourth 4.7 fifth 5.2 sixth 6.5 seventh 11.3 eighth 15.6 reverse 2.7, 4.5, 6.3, 13.7 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 145" left 145" (on concrete surface without brake) right 163" left 163" **Turning space diameter** (on concrete surface with brake applied) right 300" left 300" (on concrete surface without brake) right 341" left 341" **Power take-off** 998 rpm at 2100 engine rpm and 534 rpm at 2100 engine rpm

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 175°F. Five gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1296.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1297—CASE 2290 POWERSHIFT DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—998 rpm)								
129.08	2100	8.890	0.476	14.52	203	55	75	29.267
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
113.58	2174	8.257	0.503	13.76	198	56	76	......
0.00	2326	2.797	.....	.....	182	54	74	......
59.04	2260	5.390	0.632	10.95	190	56	76	......
129.20	2100	8.942	0.479	14.45	203	58	77	......
29.80	2292	4.072	0.945	7.32	184	56	74	......
86.83	2220	6.834	0.545	12.70	193	57	77	......
Av 69.74	**2228**	**6.049**	**0.600**	**11.53**	**192**	**56**	**76**	**29.227**

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (3I) Gear											
109.21	6556	6.25	2100	4.46	8.637	0.547	12.65	192	35	44	28.675
75% of Pull at Maximum Power—Ten Hours 8th (3I) Gear											
87.98	4951	6.66	2219	3.51	7.737	0.608	11.37	187	33	34	29.056
50% of Pull at Maximum Power—Two Hours 8th (3I) Gear											
59.86	3273	6.86	2252	2.17	6.125	0.708	9.77	186	32	36	29.185
50% of Pull at Reduced Engine Speed—Two Hours 10th (4L) Gear											
60.21	3299	6.84	1473	2.25	4.644	0.534	12.97	185	32	36	29.165
MAXIMUM POWER IN SELECTED GEARS											
97.25	12749	2.86	2152	14.69	4th (2L) Gear			191	36	42	28.660
110.81	10346	4.02	2098	7.69	5th (2I) Gear			192	36	44	28.660
111.65	9132	4.58	2098	6.54	6th (3L) Gear			192	37	45	28.670
110.89	8075	5.15	2099	5.44	7th (2H) Gear			192	37	45	28.670
111.68	6702	6.25	2099	4.24	8th (3I) Gear			192	36	45	28.670
111.54	5297	7.90	2100	3.31	9th (3H) Gear			192	37	45	28.660
108.36	4182	9.72	2100	2.61	10th (4L) Gear			192	37	45	28.660

LUGGING ABILITY IN RATED GEAR 8th (3I)

Crankshaft Speed rpm	2099	1886	1682	1473	1259	1039
Pounds Pull	6702	7353	8059	8349	8279	7797
Increase in Pull %	0	10	20	25	24	16
Horsepower	111.68	109.55	106.48	96.30	81.63	63.68
Miles Per Hour	6.25	5.59	4.95	4.33	3.70	3.06
Slip of Drivers %	4.24	4.69	5.44	5.74	5.44	5.29

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	78.0
75% of Pull at Max. Power 10 Hours	76.5
50% of Pull at Max. Power 2 Hours	76.0
50% of Pull at Reduced Engine Speed 2 Hours	74.0
Bystander in 12th (4H) gear	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 18.4-38; 8; 12	Four 18.4-38; 8; 12
Ballast	—Liquid (each inner)	965 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 11.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	105 lb	None
Height of drawbar		19 in	19 in
Static weight with operator—rear		12250 lb	10320 lb
front		3590 lb	3380 lb
total		15840 lb	13700 lb

Department of Agricultural Engineering
Dates of Test: November 9, 1978 to January 4, 1979

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 50.4 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8309 **Fuel weight** 6.918 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 4.281 gal **Drained from motor** 4.000 gal **Transmission and final drive lubricant** Case TFD fluid **Total time engine was operated** 46.0 hours

ENGINE Make Case Diesel **Type** 6 cylinder vertical with turbocharger **Serial No.** 10159921 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 15.75 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats

CHASSIS: Type standard with duals **Serial No.** 8835688 **Tread width** rear 60" to 124" front60" to 88" **Wheel base** 104" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 29.4" Vertical distance above roadway 40.6" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph** first 1.9 second 2.5 third 3.2 fourth 3.2 fifth 4.3 sixth 4.9 seventh 5.4 eighth 6.5 ninth 8.1 tenth 9.9 eleventh 13.2 twelfth 18.1 reverse 3.2, 5.4, 8.1 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 145" left 145" (on concrete surface without brake) right 163" left 163" **Turning space diameter** (on concrete surface with brake applied) right 300" left 300" (on concrete surface without brake) right 341" left 341" **Power take-off** 998 rpm at 2100 engine rpm and 534 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: Before sound tests, it was necessary to replace a hydraulic hose beneath tractor cab.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 194°F. Seven gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1297.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1298—LONG 360 DIESEL 6-SPEED

POWER TAKE-OFF PERFORMANCE

		Fuel Consumption			Temperature Degrees F			
Hp	Crankshaft speed rpm	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—659 rpm)								
36.16	2400	2.534	0.488	14.27	196	56	75	29.225
Standard Power Take-off Speed (540 rpm)—One Hour								
31.06	1966	2.156	0.484	14.41	193	57	74	29.265
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
31.62	2470	2.162	0.476	14.63	184	58	74	......
0.00	2542	0.775	.....	.....	170	57	73	......
16.09	2512	1.404	0.608	11.46	172	58	74	......
36.32	2400	2.562	0.491	14.18	194	58	77	......
8.09	2524	1.068	0.920	7.57	171	59	74	......
23.92	2491	1.727	0.503	13.85	178	60	76	......
Av 19.34	**2490**	**1.616**	**0.582**	**11.97**	**178**	**58**	**75**	**29.333**

DRAWBAR PERFORMANCE

					Fuel Consumption			Temp Degrees F			
Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 4th Gear											
31.06	2239	5.20	2401	5.82	2.494	0.559	12.45	183	47	54	28.970
75% of Pull at Maximum Power—Ten Hours 4th Gear											
25.20	1726	5.48	2485	4.22	2.078	0.574	12.13	176	40	46	28.943
50% of Pull at MAXIMUM Power—Two Hours 4th Gear											
17.68	1186	5.59	2511	3.25	1.687	0.665	10.48	175	39	43	29.105
50% of Pull at Reduced Engine Speed—Two Hours 5th Gear											
17.68	1182	5.61	1393	3.22	1.364	0.537	12.97	175	45	52	29.080
MAXIMUM POWER IN SELECTED GEARS											
17.50	4808	1.36	2511	14.94	1st Gear			175	36	39	29.150
29.11	4590	2.38	2400	14.22	2nd Gear			181	48	56	28.970
30.71	2852	4.04	2398	7.40	3rd Gear			184	49	58	29.000
31.91	2300	5.20	2401	5.85	4th Gear			183	48	56	29.020
30.13	1167	9.68	2399	2.98	5th Gear			183	48	57	28.990

LUGGING ABILITY IN RATED GEAR 4th

Crankshaft Speed rpm	2401	2160	1916	1696	1442	1199
Pounds Pull	2300	2331	2374	2563	2577	2532
Increase in Pull %	0	1	3	11	12	10
Horsepower	31.91	29.03	26.23	24.94	21.28	17.41
Miles Per Hour	5.20	4.67	4.14	3.65	3.10	2.58
Slip of Drivers %	5.85	6.08	6.08	6.54	6.77	6.77

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	100.0
75% of Pull at Max. Power 10 Hours	98.0
50% of Pull at Max. Power 2 Hours	97.0
50% of Pull at Reduced Engine Speed 2 Hours	91.5
Bystander in 6th gear	88.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 14.9-28; 4; 14	Two 14.9-28; 4; 14
Ballast	—Liquid (each)	600 lb	None
	Cast Iron (each)	365 lb	None
Front Tires	—No., size, ply & psi	Two 7.50-16; 6; 40	Two 7.50-16; 6; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Height of drawbar		18.5 in	18.5 in.
Static weight with operator	—rear	4820 lb	2890 lb
	front	1590 lb	1590 lb
	total	6410 lb	4480 lb

Department of Agricultural Engineering
Dates of Test: March 13-20, 1979

Manufacturer: Universal Tractor Brasov (UTB), Brasov, Romania

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8368 **Fuel weight** 6.967 lbs/gal **Oil SAE** 10W30 **API service classification** SE-CC **To motor** 1.719 gal **Drained from motor** 1.554 gal **Transmission and final drive lubricant** 20W40 **Total time engine was operated** 38.0 hours

ENGINE Make Universal Tractor Brasov (UTB) Diesel **Type** 3 cylinder vertical **Serial No.** 115858 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.74" x 4.33" **Compression ratio** 17.0 to 1 **Displacement** 143 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** oil bath with centrifugal precleaner **Oil filter** one full flow cartridge **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** thermostat

CHASSIS: Type standard **Serial No.** 592730 **Tread width** rear 47.3" to 74.8" front50.4" to 77.5" **Wheel base** 75" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 26.6" Vertical distance above roadway 26.2" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.4 second 2.6 third 4.1 fourth 5.2 fifth 9.3 sixth 14.6 reverse 2.1, 7.4 **Clutch** two dry discs operated by foot pedal **Brakes** band and drum operated by two foot pedals which can be locked together and hand lever **Steering** power assist **Turning radius** (on concrete surface with brake applied) right 109" left 109" (on concrete surface without brake) right 124" left 124" **Turning space diameter** (on concrete surface with brake applied) right 223" left 223" (on concrete surface without brake) right 253" left 253" **Power take-off** 540 rpm at 1966 engine rpm.

REPAIRS AND ADJUSTMENTS: During ten hour test a fuel injection line developed a leak. The line was replaced and test rerun.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 151°F. Five gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1298.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1299—FORD TW-30 DIESEL 16-SPEED

POWER TAKE-OFF PERFORMANCE

		Fuel Consumption			Temperature Degrees F			
Hp	Crank-shaft speed rpm	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1147 rpm)								
163.28	2200	10.351	0.442	15.77	189	59	75	28.650
Standard Power Take-off Speed (1000 rpm)—One Hour								
157.04	1918	9.373	0.416	16.76	189	59	75	28.685
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
153.00	2428	10.507	0.478	14.56	188	59	75	......
0.00	2467	3.096	.....	.....	183	58	74	.....
77.17	2448	6.640	0.599	11.62	185	59	76	......
163.58	2200	10.416	0.444	15.70	188	60	78	......
38.69	2454	4.728	0.851	8.18	183	58	74	......
115.07	2432	8.453	0.512	13.61	186	59	75	......
Av 91.25	**2405**	**7.307**	**0.558**	**12.49**	**186**	**59**	**75**	**28.710**

DRAWBAR PERFORMANCE

					Fuel Consumption			Temp Degrees F			
Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (5PD) Gear											
142.21	10101	5.28	2200	5.04	10.406	0.510	13.67	190	49	51	28.270
75% of Pull at Maximum Power—Ten Hours 8th (5PD) Gear											
121.22	7672	5.93	2440	3.82	9.635	0.554	12.58	186	37	42	28.884
50% of Pull at Maximum Power—Two Hours 8th (5PD) Gear											
82.63	5138	6.03	2450	2.45	7.661	0.646	10.79	185	35	39	29.125
50% of Pull at Reduced Engine Speed—Two Hours 11th (6PD) Gear											
82.34	5116	6.03	1587	2.37	5.634	0.477	14.62	184	38	44	29.085
MAXIMUM POWER IN SELECTED GEARS											
118.60	16553	2.69	2423	14.50	3rd (2PD) Gear			188	34	37	29.130
134.95	15817	3.20	2199	10.85	4th (3PD) Gear			189	43	51	28.740
135.17	15339	3.30	2199	9.86	5th (2DD) Gear			189	43	51	28.750
139.16	12064	4.33	2201	6.50	6th (3DD) Gear			188	43	51	28.750
141.74	11813	4.50	2201	6.11	7th (4PD) Gear			189	43	51	28.750
143.47	10211	5.27	2199	5.24	8th (5PD) Gear			188	43	51	28.770
140.91	8977	5.89	2199	4.52	9th (4DD) Gear			189	42	50	28.740
143.21	7812	6.87	2201	3.78	10th (5DD) Gear			189	42	50	28.730
144.17	6499	8.32	2200	3.04	11th (6PD) Gear			188	42	50	28.730

LUGGING ABILITY IN RATED GEAR 8th (5PD)

Crankshaft Speed rpm	2199	1983	1762	1541	1315	1095
Pounds Pull	10211	11177	11998	12172	11441	9828
Increase in Pull %	0	9	18	19	12	-4
Horsepower	143.47	140.62	133.32	118.07	95.26	68.81
Miles Per Hour	5.27	4.72	4.17	3.64	3.12	2.63
Slip of Drivers %	5.24	5.79	6.26	6.42	6.11	5.16

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	80.0
75% of Pull at Max. Power 10 Hours	82.0
50% of Pull at Max. Power 2 Hours	81.5
50% of Pull at Reduced Engine Speed 2 Hours	78.5
Bystander in 16th (8DD) gear	90.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 20.8-38; 10; 16	Four 20.8-38; 10; 16
Ballast	—Liquid (each inner)	1522 lb	None
	Cast Iron (each)	500 lb	None
Front Tires	—No., size, ply & psi	Two 14L-16.1; 8; 36	Two 14L-16.1; 8; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	80 lb	None
Height of drawbar		24.5 in	24.5 in
Static weight with operator	—rear	15090 lb	10045 lb
	front	4740 lb	4580 lb
	total	19830 lb	14625 lb

Department of Agricultural Engineering
Dates of Test: March 27 to April 11, 1979

Manufacturer: Ford Motor Co.—Ford Tractor Oper., 2500 E. Maple Rd., Troy, Michigan 48084

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to** 60°/60° 0.8368 **Fuel weight** 6.967 lbs/gal **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 4.273 gal **Drained from motor** 4.184 gal **Transmission and final drive lubricant** Ford M2C-53-A **Total time engine was operated** 39.5 hours.

ENGINE Make Ford Diesel **Type** six cylinder vertical with turbocharger and air-to-air intercooler **Serial No.** *M347454* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.4" x 4.4" **Compression ratio** 15.6 to 1 **Displacement** 401 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** C580929 **Tread width** rear 60.0" to 112.0" front 60.0" to 84.0" **Wheel base** 110.5" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 37.4" Vertical distance above roadway 43.6" Horizontal distance from center of rear wheel tread 0.2" to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled power shift **Advertised speeds mph** first 1.8 second 2.4 third 2.8 fourth 3.6 fifth 3.6 sixth 4.6 seventh 4.8 eighth 5.5 ninth 6.1 tenth 7.1 eleventh 8.5 twelfth 10.8 thirteenth 11.0 fourteenth 13.8 fifteenth 14.4 sixteenth 18.4 reverse 2.0, 2.6, 6.0, 7.7 **Clutch** single dry disc operated by foot pedal **Brakes** power assisted double wet disc operated hydraulically by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 161" left 164" (on concrete surface without brake) right 184" left 185" **Turning space diameter** (on concrete surface with brake applied) right 340" left 346" (on concrete surface without brake) right 386" left 388" **Power take-off** 1000 rpm at 1918 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 161°F. Nine gears were chosen between 15% and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1299.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1300—FORD TW-20 DIESEL
16-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1146 rpm)								
135.60	2199	8.934	0.459	15.18	192	57	75	28.897
Standard Power Take-off Speed (1000 rpm)—One Hour								
131.43	1918	8.105	0.430	16.22	190	57	75	28.940
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
123.84	2364	8.827	0.497	14.03	190	58	76	......
0.00	2446	2.971	.....	.....	186	56	74	......
63.10	2410	5.848	0.646	10.79	186	57	76	......
138.19	2200	9.038	0.456	15.29	192	57	74	......
31.91	2426	4.289	0.936	7.44	186	56	74	......
93.82	2386	7.307	0.543	12.84	188	58	76	......
Av 75.14	**2372**	**6.380**	**0.592**	**11.78**	**188**	**57**	**75**	**28.977**

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (5PD) Gear											
116.64	8795	4.97	2201	5.20	8.917	0.533	13.08	193	59	75	28.580
75% of Pull at Maximum Power—Ten Hours 8th (5PD) Gear											
98.46	6782	5.44	2379	3.92	8.181	0.579	12.04	189	33	38	29.116
50% of Pull at Maximum Power—Two Hours 8th (5PD) Gear											
67.50	4533	5.58	2412	2.78	6.692	0.691	10.09	190	31	33	29.045
50% of Pull at Reduced Engine Speed—Two Hours 11th (6PD) Gear											
67.58	4537	5.59	1561	2.70	4.808	0.496	14.06	188	32	34	29.040
MAXIMUM POWER IN SELECTED GEARS											
94.00	14155	2.49	2392	14.94	3rd (2PD) Gear			193	27	29	19.120
112.63	14052	3.01	2201	11.41	4th (3PD) Gear			194	58	74	28.600
113.64	13710	3.11	2200	10.15	5th (2DD) Gear			195	58	73	28.600
116.28	10700	4.08	2200	6.50	6th (3DD) Gear			194	56	70	28.630
119.61	10590	4.24	2200	6.50	7th (4PD) Gear			194	56	70	28.630
119.30	8998	4.97	2202	5.09	8th (5PD) Gear			193	52	63	28.670
118.60	8015	5.55	2199	4.64	9th (4DD) Gear			195	57	71	28.630
121.37	7032	6.47	2198	3.87	10th (5DD) Gear			194	57	71	28.630
121.47	5804	7.85	2200	3.17	11th (6PD) Gear			194	57	71	28.620
118.73	4476	9.95	2198	2.30	12th (7PD) Gear			194	57	72	28.610

LUGGING ABILITY IN RATED GEAR 8th (5PD)

Crankshaft Speed rpm	2202	1982	1760	1540	1315	1097
Pounds Pull	8998	10027	10578	10750	10256	9013
Increase in Pull %	0	11	18	19	14	0
Horsepower	119.30	118.84	110.71	98.30	80.36	59.48
Miles Per Hour	4.97	4.44	3.92	3.43	2.94	2.47
Slip of Drivers %	5.09	5.91	6.35	6.50	6.21	5.32

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	81.5
75% of Pull at Max. Power 10 Hours	82.0
50% of Pull at Max. Power 2 Hours	82.0
50% of Pull at Reduced Engine Speed 2 Hours	80.0
Bystander in 16th (8DD) gear	89.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 18.4-38; 8; 16	Four 18.4-38; 8; 16
Ballast	—Liquid (each inner)	992 lb	None
	Cast Iron (each)	455 lb	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 6; 32	Two 11.00-16; 6; 32
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	70 lb	None
Height of drawbar		21 in	21 in
Static weight with operator—rear		13540 lb	9735 lb
	front	3640 lb	3500 lb
	total	17180 lb	13235 lb

Department of Agricultural Engineering
Dates of Test: March 22 to April 10, 1979
Manufacturer: Ford Motor Co.—Ford Tractor Oper., 2500 E. Maple Rd., Troy, Michigan 48084

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8368 **Fuel weight** 6.967 lbs/gal **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 4.342 gal **Drained from motor** 3.904 gal **Transmission and final drive lubricant** Ford M2C-53-A **Total time engine was operated** 67.0 hours.

ENGINE Make Ford Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** *H347448* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.4" x 4.4" **Compression ratio** 15.6 to 1 **Displacement** 401 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow paper element **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat.

CHASSIS: Type standard with duals **Serial No.** C-597155 **Tread width** rear 60.0" to 112.0" front 60.0" to 84.0" **Wheel base** 109.7" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 33.3" Vertical distance above roadway 44.6" Horizontal distance from center of rear wheel tread 0.4" to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled power shift **Advertised speeds mph** first 1.7 second 2.2 third 2.7 fourth 3.4 fifth 3.4 sixth 4.3 seventh 4.5 eighth 5.2 ninth 5.8 tenth 6.7 eleventh 8.0 twelfth 10.1 thirteenth 10.3 fourteenth 13.0 fifteenth 13.5 sixteenth 17.4 reverse 1.9, 2.4, 5.6, 7.2 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc operated hydraulically by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 158" left 160" (on concrete surface without brake) right 178" left 180" **Turning space diameter** (on concrete surface with brake applied) right 330" left 334" (on concrete surface without brake) right 370" left 374" **Power take-off** 1000 rpm at 1918 engine rpm and 540 rpm at 1873 rpm.

REPAIRS AND ADJUSTMENTS: During the drawbar tests, erratic engine operation was observed resulting in faulty power and fuel consumption data. After readjusting the throttle linkage, the PTO tests and drawbar tests were run over again.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 169°F. Ten gears were chosen between 15% and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1300.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1301—FORD TW-10 DIESEL
16-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1199 rpm)								
110.24	2300	7.722	0.488	14.28	195	57	75	29.030
Standard Power Take-off Speed 1000 rpm)—One Hour								
101.09	1918	6.804	0.469	14.86	196	57	75	29.020
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
100.27	2464	7.256	0.504	13.82	188	56	76	......
0.00	2564	2.541	......	......	180	54	75	......
51.05	2508	4.586	0.626	11.13	185	56	75	......
110.76	2300	7.764	0.488	14.27	194	57	75	......
25.83	2537	3.617	0.976	7.14	182	56	75	......
75.91	2486	5.873	0.539	12.92	186	56	75	......
Av 60.64	**2476**	**5.273**	**0.606**	**11.50**	**186**	**56**	**75**	**29.020**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (5PD) Gear											
94.34	6761	5.23	2300	4.85	7.751	0.572	12.17	191	46	54	28.750
75% of Pull at Maximum Power—Ten Hours 8th (5PD) Gear											
80.12	5242	5.73	2480	3.37	6.728	0.585	11.91	186	31	37	29.222
50% of Pull at Maximum Power—Two Hours 8th (5PD) Gear											
54.74	3499	5.87	2515	2.44	5.365	0.683	10.20	185	39	44	28.850
50% of Pull at Reduced Engine Speed—Two Hours 11th (6PD) Gear											
54.84	3500	5.88	1625	2.20	4.127	0.524	13.29	185	39	46	28.770
MAXIMUM POWER IN SELECTED GEARS											
82.39	12006	2.57	2462	14.91	3rd (2PD) Gear			186	33	36	28.900
91.55	10661	3.22	2300	9.34	4th (3PD) Gear			190	45	54	28.760
90.58	10221	3.32	2300	8.51	5th (2DD) Gear			191	44	53	28.770
92.96	8110	4.30	2300	5.98	6th (3DD) Gear			191	43	51	28.800
95.42	8006	4.47	2300	5.83	7th (4PD) Gear			191	43	51	28.810
97.35	6984	5.23	2300	5.08	8th (5PD) Gear			191	43	51	28.820
93.05	5966	5.85	2298	4.09	9th (4DD) Gear			191	43	51	28.800
96.58	5312	6.82	2300	3.47	10th (5DD) Gear			191	43	51	28.790
97.24	4420	8.25	2300	2.92	11th (6PD) Gear			191	45	52	28.770

LUGGING ABILITY IN RATED GEAR (8th 5PD)						
Crankshaft Speed rpm	2300	2069	1831	1607	1375	1144
Pounds Pull	6984	7556	7994	8183	8260	8048
Increase in Pull %	0	8	14	17	18	15
Horsepower	97.35	94.31	87.82	78.75	67.96	55.20
Miles Per Hour	5.23	4.68	4.12	3.61	3.09	2.57
Slip of Drivers %	5.08	5.53	5.83	5.98	6.28	5.98

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	81.5
75% of Pull at Max. Power 10 Hours	82.5
50% of Pull at Max. Power 2 Hours	83.0
50% of Pull at Reduced Engine Speed 2 Hours	82.0
Bystander in 16th (8DD) gear	89.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 18.4-38; 8; 16	Four 18.4-38; 8; 16
Ballast	—Liquid (each inner)	748 lb	None
	Cast Iron (each)	170 lb	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 6; 32	Two 11.00-16; 6; 32
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	75 lb	None
Height of drawbar		21.5 in	21.5 in
Static weight with operator—rear		11760 lb	9585 lb
	front	3430 lb	3280 lb
	total	15190 lb	12865 lb

Department of Agricultural Engineering
Dates of Test: March 22 to April 9, 1979
Manufacturer: Ford Motor Co.-Ford Tractor Oper., 2500 E. Maple Rd., Troy, Michigan 48084

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to** 60°/60° 0.8368 **Fuel weight** 6.967 lbs/gal **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 4.383 gal **Drained from motor** 3.916 gal **Transmission and final drive lubricant** Ford M2C-53-A **Total time engine was operated** 57.0 hours.

ENGINE Make Ford Diesel **Type** Six cylinder **Serial No.** *G34781* **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 4.4" x 4.4" **Compression ratio** 16.3 to 1 **Displacement** 401 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one full flow paper element **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** thermostat.

CHASSIS: Type standard with duals **Serial No.** G-580930 **Tread width** rear 60.0" to 112.0" front 60.0" to 84.0" **Wheel base** 109.7" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 31.8" Vertical distance above roadway 42.8" Horizontal distance from center of rear wheel tread 0.2" to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled power shift **Advertised speeds mph** first 1.8 second 2.4 third 2.8 fourth 3.5 fifth 3.6 sixth 4.6 seventh 4.7 eighth 5.5 ninth 6.1 tenth 7.0 eleventh 8.5 twelfth 10.7 thirteenth 10.9 fourteenth 13.7 fifteenth 14.2 sixteenth 18.3 reverse 2.0, 2.5, 5.9, 7.6 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc operated hydraulically by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake) right 158" left 160" (on concrete surface without brake applied) right 178" left 180"

REPAIRS AND ADJUSTMENTS: During the limber up period the transmission low pressure warning switch failed. A new switch was installed and test continued. The new switch failed during the Maximum Drawbar Power Test in 5th (2DD) Gear and was replaced with a pipe plug. During preliminary PTO test a loss of power was observed. All injectors were removed and cleaned. One new injector was installed and fuel pump timing advanced one degree. During the Ten Hour Test the differential lock spool retaining clip broke, causing engagement of differential lock. This clip was replaced and was test run again.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 176°F. Nine gears were chosen between 15% and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1301.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers
The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1302—CASE 2390 POWERSHIFT DIESEL 12-SPEED

POWER TAKE-OFF PERFORMANCE

	Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—1002 rpm)									
	160.72	2100	10.555	0.457	15.23	191	57	75	28.753
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	140.48	2161	9.565	0.474	14.69	188	56	74	......
	0.00	2306	2.978	......	......	176	56	74	......
	72.49	2230	6.159	0.591	11.77	182	57	75	......
	160.04	2100	10.543	0.459	15.18	192	57	75	......
	36.84	2266	4.569	0.863	8.06	178	56	74	......
	107.40	2204	7.858	0.509	13.67	186	57	75	......
Av	**86.21**	**2211**	**6.945**	**0.561**	**12.41**	**184**	**57**	**75**	**28.757**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 6th (2I) Gear											
137.72	9946	5.19	2100	6.04	10.435	0.527	13.20	190	46	58	28.910
75% of Pull at Maximum Power—Ten Hours 6th (2I) Gear											
113.06	7660	5.53	2193	4.25	8.933	0.550	12.66	187	45	57	28.685
50% of Pull at Maximum Power—Two Hours 6th (2I) Gear											
78.19	5137	5.71	2231	2.78	7.112	0.633	10.99	182	40	46	28.535
50% of Pull at Reduced Engine Speed—Two Hours 9th (3H) Gear											
78.41	5139	5.72	1550	2.83	5.639	0.501	13.90	183	40	47	28.595
MAXIMUM POWER IN SELECTED GEARS											
126.89	16020	2.97	2154	14.89	3rd (1H) Gear			184	40	46	28.910
139.87	14024	3.74	2099	9.83	4th (2L) Gear			192	50	65	28.880
143.02	12138	4.42	2099	7.49	5th (3L) Gear			192	50	65	28.890
143.37	10360	5.19	2100	6.19	6th (2I) Gear			194	49	63	28.890
144.90	8985	6.05	2101	5.18	7th (3I) Gear			193	49	64	28.870
146.01	8314	6.59	2100	4.78	8th (2H) Gear			193	50	65	28.870
144.87	7094	7.66	2100	3.98	9th (3H) Gear			192	51	66	28.860

LUGGING ABILITY IN RATED GEAR (6th 2I)

Crankshaft Speed rpm	2100	1885	1678	1469	1254	1046
Pounds Pull	10360	11287	11778	11828	10918	9613
Increase in Pull %	0	9	14	14	5	-7
Horsepower	143.37	139.20	128.79	113.01	89.79	66.50
Miles Per Hour	5.19	4.62	4.10	3.58	3.08	2.59
Slip of Drivers %	6.19	6.81	7.26	7.56	6.50	5.73

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	76.5
75% of Pull at Max. Power 10 Hours	77.0
50% of Pull at Max. Power 2 Hours	77.0
50% of Pull at Reduced Engine Speed 2 Hours	74.5
Bystander in 12th (4H) gear	87.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 20.8-38; 8; 12	Four 20.8-38; 8; 12
Ballast	—Liquid (each inner)	1470 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 16.5L-16.1; 10; 36	Two 16.5L-16.1: 10; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	90 lb	None
Height of drawbar		22 in	22 in
Static weight with operator—**rear**		14450 lb	11510 lb
front		4260 lb	4080 lb
Total		18710 lb	15590 lb

Department of Agricultural Engineering
Dates of Test: April 6-16, 1979

Manufacturer: J I Case Co., 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8359 **Fuel weight** 6.960 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 5.436 gal **Drained from motor** 5.392 gal **Transmission and final drive lubricant** Case TFD Fluid **Total time engine was operated** 38.5 hours.

ENGINE Make Case Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** 10170112 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 15.8 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 8841162 **Tread width** rear 64" to 134" front 64" to 92" **Wheel base** 104" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 31.7" Vertical distance above roadway 40.7" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph** first 2.0 second 2.7 third 3.3 fourth 4.1 fifth 4.7 sixth 5.5 seventh 6.2 eighth 6.9 ninth 7.8 tenth 10.9 eleventh 14.7 twelfth 20.1 reverse 3.3, 6.9, 7.8 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 152" left 152" (on concrete surface without brake) right 169" left **Turning space diameter** (on concrete surface with brake applied) right 317" left 317" (on concrete surface without brake) right 356" left 356" **Power take-off** 1002 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 187°F. Seven gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1302**.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1303—CASE 2590 POWERSHIFT DIESEL 12-SPEED

POWER TAKE-OFF PERFORMANCE

	Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
	MAXIMUM POWER AND FUEL CONSUMPTION								
	Rated Engine Speed—Two Hours (PTO Speed—1003 rpm)								
	180.38	2100	11.611	0.448	15.53	203	57	75	28.697
	VARYING POWER AND FUEL CONSUMPTION—Two Hours								
	158.51	2174	10.478	0.460	15.13	196	56	75	......
	0.00	2314	2.957	.....	.....	176	56	74	......
	82.28	2256	6.659	0.563	12.35	187	56	74	......
	181.44	2101	11.707	0.450	15.47	203	57	76	......
	41.94	2291	4.793	0.795	8.75	182	56	74	......
	121.42	2214	8.517	0.488	14.26	191	56	76	......
Av	97.55	2225	7.519	0.536	12.97	189	56	75	28.675

DRAWBAR PERFORMANCE

Hp	Draw-bar pull-lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 6th (2I) Gear											
153.24	11111	5.17	2100	6.62	11.422	0.519	13.42	201	58	70	28.945
75% of Pull at Maximum Power—Ten Hours 6th (2I) Gear											
125.09	8495	5.52	2194	4.57	9.601	0.534	13.03	194	60	71	28.954
50% of Pull at Maximum Power—Two Hours 6th (2I) Gear											
87.18	5687	5.75	2250	3.12	7.471	0.596	11.67	189	60	72	28.920
50% of Pull at Reduced Engine Speed—Two Hours 9th (3H) Gear											
86.70	5657	5.75	1559	3.12	6.178	0.496	14.03	188	58	69	28.960
MAXIMUM POWER IN SELECTED GEARS											
142.11	17865	2.98	2155	14.83	3rd (1H) Gear			192	54	60	28.950
152.59	15381	3.72	2100	10.48	4th (2L) Gear			197	55	66	28.960
156.38	13328	4.40	2099	8.08	5th (3L) Gear			199	55	66	28.960
156.10	11318	5.17	2098	6.58	6th (2I) Gear			199	53	63	28.950
158.73	9874	6.03	2100	5.65	7th (3I) Gear			199	55	67	28.960
159.01	9073	6.57	2101	5.10	8th (2H) Gear			199	56	68	28.960
157.83	7752	7.64	2099	4.22	9th (3H) Gear			199	57	69	28.950

LUGGING ABILITY IN RATED GEAR (6th 2I)

Crankshaft Speed rpm	2098	1887	1681	1465	1251	1046
Pounds Pull	11318	11988	12194	11873	11269	10037
Increase in Pull %	0	6	8	5	0	-11
Horsepower	156.10	147.93	133.81	113.82	92.58	69.50
Miles Per Hour	5.17	4.63	4.12	3.59	3.08	2.60
Slip of Drivers %	6.58	7.04	7.34	7.04	6.73	5.96

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	77.0
75% of Pull at Max. Power 10 Hours	77.0
50% of Pull at Max. Power 2 Hours	76.5
50% of Pull at Reduced Engine Speed 2 Hours	75.0
Bystander in 12th (4H) gear	87.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 20.8-38; 8; 14	Four 20.8-38; 8; 14
Ballast	—Liquid (each)	1008 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 16.5L-16.1 10; 36	Two 16.5L-16.1; 10; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	365 lb	None
Height of drawbar		22 in	22 in
Static weight with operator—rear		15670 lb	11640 lb
	front	4830 lb	4100 lb
	Total	20500 lb	15740 lb

Department of Agricultural Engineering
Dates of Test: April 9-19, 1979

Manufacturer: J I Case Co., 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8359 **Fuel weight** 6.960 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 6.167 gal **Drained from motor** 6.027 gal **Transmission and final drive lubricant** Case TFD Fluid **Total time engine was operated** 40.5 hours.

ENGINE Make Case Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** 1017382 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 15.8 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 8840761 **Tread width** rear 64" to 134" front 64" to 92" **Wheel base** 104" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 30.9" Vertical distance above roadway 39.8" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph** first 2.0 second 2.7 third 3.3 fourth 4.1 fifth 4.7 sixth 5.5 seventh 6.2 eighth 6.9 ninth 7.8 tenth 10.9 eleventh 14.7 twelfth 20.1 reverse 3.3, 6.9, 7.8 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 152" left 152" (on concrete surface without brake) right 169" left 169" **Turning space diameter** (on concrete surface with brake applied) right 317" left 317" (on concrete surface without brake) right 356" left 356" **Power take-off** 1003 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was We, the Seven gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1303.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1304—CASE 2090 MANUAL DIESEL 8-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—998 rpm)								
108.74	2100	7.061	0.452	15.40	189	61	75	28.997
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
95.40	2168	6.409	0.468	14.88	186	62	76	......
0.00	2316	2.379	......	......	176	62	74	......
49.49	2256	4.263	0.599	11.61	182	62	75	......
109.54	2100	7.125	0.453	15.37	192	62	75	......
25.09	2288	3.259	0.904	7.70	177	62	74	......
73.07	2214	5.405	0.515	13.52	184	63	76	......
Av 58.77	**2224**	**4.807**	**0.569**	**12.23**	**183**	**62**	**75**	**29.010**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 5th (3L) Gear											
93.17	6288	5.56	2100	5.64	6.950	0.519	13.41	189	59	71	28.915
75% of Pull at Maximum Power—Ten Hours 5th (3L) Gear											
75.53	4801	5.90	2191	3.94	5.952	0.548	12.69	185	63	69	28.778
50% of Pull at Maximum Power—Two Hours 5th (3L) Gear											
52.59	3217	6.13	2249	2.74	4.903	0.649	10.73	179	46	48	28.925
50% of Pull at Reduced Engine Speed—Two Hours 6th (3H) Gear											
52.26	3191	6.14	1786	2.58	4.059	0.541	12.88	180	47	49	28.980
MAXIMUM POWER IN SELECTED GEARS											
80.04	11655	2.58	2182	14.61	2nd (1H) Gear			183	51	55	28.990
92.11	9782	3.53	2099	9.96	3rd (2L) Gear			191	60	74	28.930
94.99	7747	4.60	2099	6.95	4th (2H) Gear			191	60	74	28.930
94.93	6397	5.57	2100	5.48	5th (3L) Gear			191	60	74	28.940
95.31	5036	7.10	2099	4.13	6th (3H) Gear			191	60	74	28.930

LUGGING ABILITY IN RATED GEAR (5th 3L)

Crankshaft Speed rpm	2100	1886	1679	1467	1256	1049
Pounds Pull	6397	6935	7269	7252	6856	6271
Increase in Pull %	0	8	14	13	7	-2
Horsepower	94.93	91.90	85.41	74.48	60.49	46.48
Miles Per Hour	5.57	4.97	4.41	3.85	3.31	2.78
Slip of Drivers %	5.48	6.03	6.34	6.49	6.03	5.56

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	77.0
75% of Pull at Max. Power 10 Hours	76.0
50% of Pull at Max. Power 2 Hours	77.5
50% of Pull at Reduced Engine Speed 2 Hours	76.0
Bystander in 8th (4H) gear	89.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Two 20.8-38; 8; 18	Two 20.8-38; 8; 18
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	1440 lb	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 11.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	120 lb	None
Height of drawbar		21 in	21 in
Static weight with operator	—rear	11490 lb	8610 lb
	front	3540 lb	3300 lb
	Total	15030 lb	11910 lb

Department of Agricultural Engineering
Dates of Test: April 11-21, 1979

Manufacturer: J I Case Co., 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8359 **Fuel weight** 6.960 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 4.233 gal **Drained from motor** 3.989 gal **Transmission and final drive lubricant** Case TFD Fluid **Total time engine was operated** 34.5 hours.

ENGINE Make Case Diesel **Type** Six cylinder vertical **Serial No.** 10172513 **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 16 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard **Serial No.** 8841892 **Tread width** rear 64" to 88" front 60" to 88" **Wheel base** 104" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 29.0" Vertical distance above roadway 41.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 2.2 second 2.8 third 3.8 fourth 4.8 fifth 5.4 sixth 6.7 seventh 11.7 eighth 16.1 reverse 2.7, 4.6, 6.5, 14.1 **Clutch** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 142" left 142" (on concrete surface without brake) right 167" left 167" **Turning space diameter** (on concrete surface with brake applied) right 296" left 296" (on concrete surface without brake) right 347" left 347" **Power take-off** 998 rpm at 2100 engine rpm and 534 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 183°F. Five gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1304.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1305—DEUTZ DX-90 DIESEL
15-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer Inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1111 rpm)								
84.47	2300	5.196	0.428	16.26	air	62	75	29.013
Standard Power Take-off Speed (1000 rpm)—One Hour								
80.82	2071	4.912	0.423	16.45	air	62	75	29.040
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
73.11	2348	4.372	0.416	16.72	air	62	75	......
0.00	2454	1.281	......	......	air	62	75	......
37.58	2404	2.738	0.507	13.73	air	62	75	......
86.10	2301	5.316	0.430	16.20	air	61	75	......
18.98	2418	1.953	0.716	9.72	air	62	75	......
55.69	2375	3.527	0.441	15.79	air	61	75	......
Av 45.24	2385	3.198	0.492	14.15	air	61	75	29.063

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer Inches of Mercury
Maximum Available Power—Two Hours 9th (1S) Gear											
69.95	5294	4.95	2299	7.81	5.066	0.504	13.81	air	60	67	28.660
75% of Pull at Maximum Power—Ten Hours 9th (1S) Gear											
57.50	4157	5.19	2361	6.02	4.085	0.494	14.07	air	60	70	28.918
50% of Pull at Maximum Power—Two Hours 9th (1S) Gear											
40.05	2783	5.40	2407	4.05	3.234	0.562	12.39	air	58	61	28.750
50% of Pull at Reduced Engine Speed—Two Hours 12th (5Z) GEAR											
39.82	2761	5.41	1517	3.98	2.623	0.458	15.18	air	58	64	28.725
MAXIMUM POWER IN SELECTED GEARS											
52.37	8786	2.24	2353	14.78	4th (1Z) Gear			air	60	70	28.650
68.41	8723	2.94	2299	14.38	5th (4L) Gear			air	60	69	28.640
69.52	7618	3.42	2298	12.52	6th (2Z) Gear			air	52	68	29.070
69.66	6949	3.76	2300	10.88	7th (5L) Gear			air	52	67	29.080
71.41	6153	4.35	2300	9.24	8th (3Z) Gear			air	52	66	29.090
72.74	5533	4.93	2298	8.20	9th (1S) Gear			air	51	65	29.100

LUGGING ABILITY IN RATED GEAR (9th 1S)

Crankshaft Speed rpm	2298	2069	1840	1606	1379	1142
Pounds Pull	5533	5866	6164	6128	5999	5770
Increase in Pull %	0	6	11	11	8	4
Horsepower	72.74	69.00	64.13	55.72	46.90	37.49
Miles Per Hour	4.93	4.41	3.90	3.41	2.93	2.44
Slip of Drivers %	8.20	8.92	9.30	9.30	9.05	8.92

TRACTOR SOUND LEVEL WITH CAB dB(A)

	With European Cab	With American Cab
Maximum Available Power—Two Hours	81.5	83.5
75% of Pull at Maximum Power—Ten Hours	81.0	80.0
50% of Pull at Maximum Power—Two Hours	80.0	80.5
50% of Pull at Reduced Engine Speed—Two Hours	78.0	79.5
Bystander in 15th (5S) Gear		89.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Two 18.4-34; 6; 16	Two 8.4-34; 6; 16
Ballast	—Liquid (each)	815 lb	None
	Cast Iron (each)	720 lb	None
Front Tires	—No., size, ply & psi	Two 10.00-16; 6; 32	Two 10.00-16; 6; 32
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	70 lb	None
Height of drawbar		24.5 in	24.5 in
Static weight with operator—rear		9700 lb	6630 lb
front		3450 lb	3310 lb
Total		13150 lb	9940 lb

Department of Agricultural Engineering

Dates of Test: April 18-25, 1979

Manufacturer: Klockner-Humboldt-Deutz, AG 5, Cologne 80, West Germany.

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8357 **Fuel weight** 6.958 lbs/gal **Oil** SAE 30 API **service classification** SB/SE-CA/CD **To motor** 3.555 gal **Drained from motor** 2.883 gal **Transmission and final drive lubricant** SAE 20W20 **Total time engine was operated** 46.0 hours.

ENGINE Make Deutz Diesel **Type** Five cylinder vertical **Serial No.** 6027267 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.94" x 4.72" **Compression ratio** 17 to 1 **Displacement** 287 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one paper cartridge **Oil cooler** radiator for crankcase oil, radiator for hydraulic oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** air cooled.

CHASSIS: Type standard **Serial No.** 7618 0434 **Tread width** rear 63.0" to 78.7" front 58.1" to 77.8" **Wheel base** 100.7" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 35.6" Vertical distance above roadway 37.8" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.3 second 2.0 third 2.5 fourth 2.7 fifth 3.6 sixth 4.1 seventh 4.4 eighth 5.0 ninth 5.6 tenth 7.3 eleventh 8.6 twelfth 9.0 thirteenth 10.6 fourteenth 15.5 fifteenth 18.6 reverse 3.3, 5.0, 6.2, 9.0, 11.0 **Clutch** single dry disc operated by foot pedal **Brakes** double dry disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 153.5" left 148.7" (on concrete surface without brake) right 170.4" left 165.7" **Turning space diameter** (on concrete surface with brake applied) right 316.4" left 306.9" (on concrete surface without brake) right 350.2" left 340.8" **Power take-off** 1000 rpm at 2071 engine rpm and 540 rpm at 2057 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 170°F. Nine gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1305.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1306—DEUTZ DX-110 DIESEL
15-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1110 rpm)								
100.29	2300	6.677	0.463	15.02	air	64	75	28.727
Standard Power Take-off Speed (1000 rpm)—One Hour								
93.61	2071	6.200	0.461	15.10	air	65	75	28.710
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
87.13	2354	5.359	0.428	16.26	air	65	75	......
0.00	2428	1.479	......	......	air	64	74	......
44.22	2398	3.208	0.505	13.78	air	64	75	......
100.61	2300	6.761	0.468	14.88	air	65	76	......
22.33	2398	2.311	0.720	9.66	air	64	76	......
65.66	2360	4.217	0.447	15.57	air	64	75	......
Av 53.32	2372	3.889	0.507	13.71	air	64	75	28.677

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 9th (1S) Gear											
87.19	6142	5.32	2300	5.76	6.449	0.515	13.52	air	49	58	28.830
75% of Pull at Maximum Power—Ten Hours 9th (1S) Gear											
68.97	4660	5.55	2356	4.07	4.915	0.496	14.03	air	41	49	28.959
50% of Pull at Maximum Power—Two Hours 9th (1S) Gear											
47.29	3128	5.67	2371	2.77	3.755	0.552	12.60	air	52	65	28.700
50% of Pull at Reduced Engine Speed—Two Hours 12th (5Z) Gear											
47.07	3119	5.66	1492	2.65	3.126	0.462	15.06	air	44	54	28.945
MAXIMUM POWER IN SELECTED GEARS											
75.44	11773	2.40	2350	12.70	4th (1Z) Gear			air	41	47	28.960
85.80	10009	3.21	2299	10.95	5th (4L) Gear			air	52	65	28.770
86.57	8642	3.76	2298	8.64	6th (2Z) Gear			air	51	64	28.770
86.28	7906	4.09	2299	7.51	7th (5L) Gear			air	51	64	28.780
87.91	6993	4.71	2300	6.49	8th (3Z) Gear			air	51	64	28.790
88.24	6217	5.32	2298	5.68	9th (1S) Gear			air	53	66	28.740
90.82	4868	7.00	2300	4.48	10th (4Z) Gear			air	52	65	28.770
89.34	40.22	8.33	2301	3.47	11th (2S) Gear			air	53	66	28.760

LUGGING ABILITY IN RATED GEAR (9th 1S)

Crankshaft Speed rpm	2298	2072	1843	1608	1376	1146
Pounds Pull	6217	6500	6746	6756	6750	6640
Increase in Pull %	0	5	9	9	9	7
Horsepower	88.24	82.95	76.38	66.69	57.03	46.71
Miles Per Hour	5.32	4.79	4.25	3.70	3.17	2.64
Slip of Drivers %	5.68	5.98	6.27	6.27	6.27	6.13

TRACTOR SOUND LEVEL WITH CAB dB(A)

	With European Cab	With American Cab
Maximum Available Power—Two Hours	82.5	84.5
75% of Pull at Maximum Power—Ten Hours	82.5	83.0
50% of Pull at Maximum Power—Two Hours	82.0	83.0
50% of Pull at Reduced Engine Speed—Two Hours	77.5	78.0
Bystander in 15th (5S) Gear	.....	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 18.5-38; 8; inner 14 outer 12	Four 18.4-38; 8; inner 14 outer 12
Ballast	—Liquid (each inner)	1000 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 11.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	180 lb	None
Height of drawbar		27 in	27 in
Static weight with operator—rear		11180 lb	9180 lb
	front	3760 lb	3400 lb
	Total	14940 lb	12580 lb

Department of Agricultural Engineering

Dates of Test: April 21-30, 1979

Manufacturer: Klockner-Humboldt-Deutz, AG5, Cologne 80, West Germany.

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8357 **Fuel weight** 6.958 lbs/gal **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 6.007 gal **Drained from motor** 3.235 gal **Transmission and final drive lubricant** SAE 20W20 **Total time engine was operated** 46.0 hours.

ENGINE Make Deutz Diesel **Type** 6 cylinder vertical **Serial No.** 5909217 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.94" x 4.72" **Compression ratio** 17 to 1 **Displacement** 345 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one paper cartridge **Oil cooler** radiator for crankcase oil, radiator for hydraulic oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** air cooled.

CHASSIS: Type standard with duals **Serial No.** 7620 0190 **Tread width** rear 70.9" to 126" front 59.1" to 82.7" **Wheel base** 105.8" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 36.5" Vertical distance above roadway 39.2" Horizontal distance from center of rear wheel tread 0.3" to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.3 second 2.0 third 2.5 fourth 2.7 fifth 3.6 sixth 4.1 seventh 4.5 eighth 5.1 ninth 5.7 tenth 7.4 eleventh 8.7 twelfth 9.1 thirteenth 10.7 fourteenth 15.5 fifteenth 18.6 reverse 3.3, 5.1, 6.2, 9.1, 11.1 **Clutch** single dry disc operated by foot pedal **Brakes** double dry disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 163" left 159" (on concrete surface without brake) right 183.5" left 180.7" **Turning space diameter** (on concrete surface with brake applied) right 344" left 337" (on concrete surface without brake) right 385" left 380.4" **Power take-off** 1000 rpm at 2071 engine rpm and 540 rpm at 2060 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 167°F. Eight gears were chosen between stability limit and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1306.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1307—DEUTZ DX-160 DIESEL 24-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1148 rpm)								
145.41	2200	8.425	0.403	17.26	air	60	75	28.830
Standard Power Take-off Speed (1000 rpm)—One Hour								
140.99	1917	7.913	0.391	17.82	air	60	75	28.810
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
125.59	2236	7.455	0.413	16.85	air	60	75	......
0.00	2337	2.031	......	......	air	60	76	......
64.11	2283	4.704	0.510	13.63	air	60	75	......
145.69	2200	8.481	0.405	17.18	air	60	76	......
32.49	2314	3.272	0.701	9.93	air	60	74	......
95.32	2264	6.071	0.443	15.70	air	60	74	......
Av 77.20	2272	5.336	0.481	14.47	air	60	75	28.770

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 15th (3ZH) Gear											
121.64	8074	5.65	2199	5.76	8.354	0.478	14.56	air	57	66	28.780
75% of Pull at Maximum Power—Ten Hours 15th (3ZH) Gear											
97.75	6205	5.91	2263	4.29	7.010	0.499	13.95	air	42	52	29.026
50% of Pull at Maximum Power—Two Hours 15th (3ZH) Gear											
67.33	4146	6.09	2292	2.62	5.641	0.583	11.93	air	47	50	28.850
50% of Pull at Reduced Engine Speed—Two Hours 20th (2SH) Gear											
67.06	4140	6.08	1444	2.66	4.455	0.462	15.05	air	59	72	28.725
MAXIMUM POWER IN SELECTED GEARS											
109.06	15172	2.70	2235	14.41	7th (1ZH) Gear			air	53	60	28.810
115.03	14333	3.01	2200	13.32	8th (2ZL) Gear			air	52	58	28.820
116.36	13979	3.12	2200	13.39	9th (3LH) Gear			air	47	58	28.830
118.18	12329	3.59	2200	10.16	10th (4LL) Gear			air	47	58	28.840
123.34	11695	3.96	2199	9.10	11th (2ZH) Gear			air	47	59	28.840
121.16	10293	4.41	2201	7.64	12th (3ZL) Gear			air	47	59	28.840
124.20	10030	4.64	2199	7.49	13th (4LH) Gear			air	47	60	28.850
121.17	9021	5.04	2199	6.52	14th (1SL) Gear			air	47	60	28.850
124.24	8274	5.63	2199	6.22	15th (3ZH) Gear			air	48	61	28.860
122.14	7254	6.31	2200	5.22	16th (4ZL) Gear			air	47	57	28.830
124.81	7296	6.41	2198	5.14	17th (1SH) Gear			air	47	55	28.830
121.29	6295	7.23	2200	4.67	18th (2SL) Gear			air	47	53	28.830
123.44	5783	8.00	2202	4.27	19th (4ZH) Gear			air	48	52	28.820

LUGGING ABILITY IN RATED GEAR (15th 3ZH)

Crankshaft Speed rpm	2199	1980	1758	1545	1317	1095
Pounds Pull	8274	9098	9881	9627	8327	6807
Increase in Pull %	0	10	19	16	1	-18
Horsepower	124.24	122.11	116.96	100.27	74.80	51.49
Miles Per Hour	5.63	5.03	4.44	3.91	3.37	2.84
Slip of Drivers %	6.22	6.97	7.57	7.27	6.22	4.98

TRACTOR SOUND LEVEL WITH CAB dB(A)

	With European Cab	With American Cab
Maximum Available Power—Two Hours	80.5	80.5
75% of Pull at Maximum Power—Ten Hours	80.5	81.5
50% of Pull at Maximum Power—Two Hours	79.5	81.5
50% of Pull at Reduced Engine Speed—Two Hours	76.5	80.0
Bystander in 24th (4SH) gear	.....	86.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 20.8-38; 8; 12	Four 20.8-38; 8; 12
Ballast	—Liquid (each)	875 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 1.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	185 lb	None
Height of drawbar		24.5 in	24.5 in.
Static weight with operator—rear		14040 lb	10540 lb
front		4670 lb	4300 lb
Total		18710 lb	14840 lb

Department of Agricultural Engineering

Dates of Test: April 24 to May 2, 1979

Manufacturer: Klockner-Humboldt-Deutz, AG5, Cologne 80, West Germany.

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8357 **Fuel weight** 6.958 lbs/gal **Oil SAE 30 API service classification** SB/SE-CA/CD **To motor** 4.648 gal **Drained from motor** 3.082 gal **Transmission and final drive lubricant** SAE 20W30 **Total time engine was operated** 42.5 hours.

ENGINE Make Deutz Diesel **Type** 6 cylinder vertical with turbocharger **Serial No.** 6011763 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.02" x 4.92" **Compression ratio** 15.5 to 1 **Displacement** 374 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** one paper cartridge **Oil cooler** radiator for crankcase oil, radiator for hydraulic oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** air cooled.

CHASSIS: Type standard with duals **Serial No.** 7624 0013 **Tread width** rear 70.9" to 126" front 62.8" to 86.6" **Wheel base** 111.5" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 39.8" Vertical distance above roadway 40.6" Horizontal distance from center of rear wheel tread 0.2" to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ration with partial (2) range operator controlled power shift **Advertised speeds mph** first 1.5 second 1.9 third 2.1 fourth 2.5 fifth 2.7 sixth 2.9 seventh 3.2 eighth 3.5 ninth 3.7 tenth 4.1 eleventh 4.4 twelfth 4.9 thirteenth 5.1 fourteenth 5.5 fifteenth 6.1 sixteenth 6.8 seventeenth 6.9 eighteenth 7.7 nineteenth 8.5 twentieth 9.7 twenty-first 10.6 twenty-second 13.3 twenty-third 14.8 twenty-fourth 18.6 reverse 2.6, 3.3, 3.7, 4.6, 5.1, 6.3, 7.0, 8.8 **Clutch** single dry disc operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 166.2" left 179.9" (on concrete surface without brake) right 185.8" left 196.5" **Turning space diameter** (on concrete surface with brake applied) right 352" left 362" (on concrete surface without brake) right 392" left 413" **Power take-off** 1000 rpm at 1917 engine rpm.

REPAIRS AND ADJUSTMENTS: The cooling fan belts were replaced at completion of limber up test.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 122°F. Thirteen gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1307.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1308—
ALLIS-CHALMERS 7045 POWERSHIFT DIESEL
12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1021 rpm)								
146.88	2300	9.950	0.471	14.76	192	60	75	28.987
Standard Power Take-off Speed (1000 rpm)—One Hour								
146.67	2253	9.828	0.466	14.92	191	58	75	28.980
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
130.58	2404	9.328	0.497	14.00	184	58	75	......
0.00	2547	3.552	......	......	176	58	75	......
67.80	2496	6.487	0.666	10.45	181	58	74	......
146.64	2300	9.953	0.472	14.73	188	58	75	......
34.15	2524	5.039	1.027	6.78	176	58	75	......
99.87	2454	7.944	0.544	12.57	183	58	75	......
Av 79.84	**2454**	**7.050**	**0.615**	**11.32**	**181**	**58**	**75**	**28.980**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 5th (1F) Gear											
123.35	9380	4.93	2300	5.29	9.806	0.553	12.58	188	59	75	28.565
75% of Pull at Maximum Power—Ten Hours 5th (1F) Gear											
102.69	7277	5.29	2430	3.82	8.768	0.594	11.71	186	58	70	28.406
50% of Pull at Maximum Power—Two Hours 5th (1F) Gear											
70.67	4832	5.48	2486	2.56	7.346	0.723	9.62	180	62	66	28.340
50% of Pull at Reduced Engine Speed—Two Hours 7th (2F) Gear											
70.77	4840	5.48	1802	2.52	5.603	0.551	12.63	184	55	59	28.415
MAXIMUM POWER IN SELECTED GEARS											
98.94	15449	2.40	2436	14.76	2nd (2S) Gear			183	65	70	28.300
118.05	13534	3.27	2299	10.67	3rd (3S) Gear			188	57	74	28.630
122.50	10598	4.33	2300	6.23	4th (4S) Gear			191	57	73	28.640
127.17	9699	4.92	2297	5.37	5th (1F) Gear			189	55	70	28.680
119.92	8233	5.46	2299	4.49	6th (5S) Gear			186	57	74	28.620
127.61	6916	6.92	2300	3.52	7th (2F) Gear			185	57	74	28.610
119.52	6422	6.98	2300	3.44	8th (6S) Gear			192	57	74	28.600
122.54	4766	9.64	2298	2.36	9th (3F) Gear			189	58	74	28.580

LUGGING ABILITY IN RATED GEAR (5th 1F)

Crankshaft Speed rpm	2297	2070	1843	1608	1409	1158
Pounds Pull	9699	10922	12085	12194	12030	11146
Increase in Pull %	0	13	25	26	24	15
Horsepower	127.17	127.75	123.94	109.03	94.40	72.62
Miles Per Hour	4.92	4.39	3.85	3.35	2.94	2.44
Slip of Drivers %	5.37	6.15	7.68	7.83	7.68	6.77

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	76.0
75% of Pull at Max. Power 10 Hours	75.5
50% of Pull at Max. Power 2 Hours	76.5
50% of Pull at Reduced Engine Speed 2 Hours	73.5
Bystander in 12th (6F) gear	88.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 20.8-38; 8; 14	Four 20.8-38; 8; 14
Ballast	—Liquid (each)	1088 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 11.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	20 lb	None
Height of drawbar		19 in	19 in
Static weight with operator	—rear	15120 lb	10770 lb
	front	3870 lb	3830 lb
	Total	18990 lb	14600 lb

Department of Agricultural Engineering

Dates of Test: May 3-8, 1979

Manufacturer: Allis-Chalmers Corporation, P.O. Box 512, Milwaukee, Wisconsin 53201

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8359 **Fuel weight** 6.960 lbs/gal **Oil SAE** 30 **API service classification** SE/CD **To motor** 3.991 gal **Drained from motor** 2.908 gal **Transmission and final drive lubricant** AC Power Fluid 821 **Total time engine was operated** 36.5 hours.

ENGINE Make Allis-Chalmers Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** 70-00969 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 4.25" x 5.00" **Compression ratio** 16 to 1 **Displacement** 426 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil and radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard with duals **Serial No.** 7045 S 2012 **Tread width** rear 66" to 144" front 62" to 90" **Wheel base** 106" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 27.8" Vertical distance above roadway 36.1" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (6) range operator controlled power shift **Advertised speeds mph** first 2.0 second 2.7 third 3.7 fourth 4.7 fifth 5.3 sixth 5.8 seventh 7.3 eighth 7.3 ninth 10.0 tenth 12.6 eleventh 15.6 twelfth 19.7 reverse 3.2, 8.5 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 145.5" left 143" (on concrete surface without brake) right 199" left 196" **Turning space diameter** (on concrete surface with brake applied) right 295" left 291" (on concrete surface without brake) right 420" left 415" **Power take-off** 1000 rpm at 2253 engine rpm and 540 rpm at 2230 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 151°F. Eight gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1308.**

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers
The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1309—MASSEY-FERGUSON 2675 DIESEL 24-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption		Hp-hr per gal	Temperature Degrees F			Barometer Inches of Mercury
		Gal per hr	Lb per hp-hr		Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1196 rpm)								
103.29	2500	7.240	0.488	14.27	194	59	75	29.013
Standard Power Take-off Speed (1000 rpm)—One Hour								
96.67	2091	6.266	0.451	15.43	196	58	75	29.005
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
92.62	2641	6.589	0.495	14.06	190	56	74	......
0.00	2758	2.436	......	......	180	58	75	......
47.46	2706	4.325	0.634	10.97	184	58	75	......
104.37	2500	7.288	0.486	14.32	194	58	76	......
23.91	2725	3.320	0.966	7.20	182	58	75	......
70.37	2676	5.339	0.528	13.18	186	58	76	......
Av 56.45	2668	4.883	0.602	11.56	186	58	75	29.000

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption		Hp-hr per gal	Temp Degrees F			Barometer Inches of Mercury
					Gal per hr	Lb per hp-hr		Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 14th (5I) Gear											
84.29	6226	5.08	2499	7.28	7.169	0.592	11.76	197	58	76	29.085
75% of Pull at Maximum Power—Ten Hours 14th (5I) Gear											
71.13	4839	5.51	2651	5.01	6.188	0.605	11.49	194	64	81	28.814
50% of Pull at Maximum Power—Two Hours 14th (5I) Gear											
49.18	3234	5.70	2698	3.42	4.941	0.699	9.95	188	64	78	28.930
50% of Pull at Reduced Engine Speed—Two Hours 19th (6H) Gear											
48.90	3225	5.69	1514	3.46	3.540	0.504	13.82	193	66	83	28.875
MAXIMUM POWER IN SELECTED GEARS											
77.63	9674	3.01	2596	14.94	9th (4L) Gear			194	63	69	28.770
81.51	8875	3.44	2500	12.47	10th (5L) Gear			197	59	70	28.950
83.97	8191	3.84	2498	9.99	11th (3H) Gear			196	59	69	28.950
86.21	7454	4.34	2500	8.55	12th (4I) Gear			196	58	68	28.950
85.19	6299	5.07	2499	6.78	13th (6L) Gear			195	57	67	28.950
87.47	6446	5.09	2501	7.07	14th (5I) Gear			196	55	63	28.960
86.16	5690	5.68	2498	6.49	15th (4H) Gear			197	60	71	28.950
86.76	4901	6.64	2500	5.52	16th (5H) Gear			196	60	72	28.950
86.99	4522	7.21	2498	4.87	17th (6I) Gear			196	61	73	28.950
86.69	4270	7.61	2498	4.49	18th (7L) Gear			196	61	74	28.950
84.39	3380	9.36	2499	3.49	19th (6H) Gear			196	61	73	28.950

LUGGING ABILITY IN RATED GEAR (14th 5I)

Crankshaft Speed rpm	2501	2255	1998	1742	1497	1244
Pounds Pull	6446	6944	7361	7746	7761	7612
Increase in Pull %	0	8	14	20	20	18
Horsepower	87.47	84.42	78.78	71.80	61.74	50.40
Miles Per Hour	5.09	4.56	4.01	3.48	2.98	2.48
Slip of Drivers %	7.07	7.64	8.20	8.90	9.03	8.76

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	81.5
75% of Pull at Max. Power 10 Hours	83.0
50% of Pull at Max. Power 2 Hours	82.0
50% of Pull at Reduced Engine Speed 2 Hours	79.0
Bystander in 23rd (8I) gear	91.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 18.4-38; 10; 22	Two 18.4-38; 10; 22
Ballast	—Liquid (each)	1032 lb	None
Front Tires	—No., size, ply & psi	Two 11.00x16; 6; 32	Two 1.00-16; 6; 32
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Height of drawbar		21.5 in	21.5 in
Static weight with operator—rear		10635 lb	8579 lb
	front	3860 lb	3860 lb
	Total	14495 lb	12430 lb

Department of Agricultural Engineering

Dates of Test: May 8-18, 1979

Manufacturer: Massey-Ferguson Inc., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 fating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8356 **Fuel weight** 6.957 lbs/gal **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 4.137 gal **Drained from motor** 3.519 gal **Transmission and final drive lubricant** MF Permatran **Total time engine was operated** 38.0 hours.

ENGINE Make Perkins Diesel **Type** Six cylinder vertical **Serial No.** TW31008N28496F **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.875" x 5.0" **Compression ratio** 16 to 1 **Displacement** 354 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard **Serial No.** 9R 002625 **Tread width** rear 65" to 95" front 60" to 80" **Wheel base** 105.4" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 34.4" Vertical distance above roadway 43.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled power shift **Advertised speeds mph** first 1.2 second 1.6 third 1.6 fourth 2.1 fifth 2.3 sixth 2.4 seventh 2.9 eighth 3.3 ninth 3.4 tenth 3.9 eleventh 4.2 twelfth 4.7 thirteenth 5.4 fourteenth 5.4 fifteenth 6.0 sixteenth 6.9 seventeenth 7.5 eighteenth 7.9 nineteenth 9.6 twentieth 11.0 twenty-first 11.2 twenty-second 14.1 twenty-third 15.6 twenty-fourth 20.0 reverse 2.1, 2.9, 4.2, 6.0 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 135" left 135" (on concrete surface without brake) right 180" left 180" **Turning space diameter** (on concrete surface with brake applied) right 294" left 294" (on concrete surface without brake) right 381" left 381" **Power take-off** 1000 rpm at 2091 engine rpm and 540 rpm at 1992 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 147°F. Eleven gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1309.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1310—MASSEY-FERGUSON 2705 DIESEL 24-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer Inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1196 rpm)								
122.20	2500	8.038	0.458	15.20	188	63	75	28.547
Standard Power Take-off Speed (1000 rpm)—One Hour								
115.85	2091	6.960	0.418	16.65	189	62	75	28.570
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
111.41	2681	7.978	0.498	13.97	188	62	76	......
0.00	2811	3.247	......	......	181	62	75	......
57.05	2752	5.610	0.684	10.17	184	62	76	......
122.87	2500	8.042	0.455	15.28	189	62	75	.....
28.80	2778	4.446	1.074	6.48	182	62	75	......
85.01	2725	6.787	0.555	12.52	186	62	75	......
Av 67.52	**2708**	**6.018**	**0.620**	**11.22**	**185**	**62**	**75**	**28.587**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer Inches of Mercury
Maximum Available Power—Two Hours 14th (5I) Gear											
101.44	7205	5.28	2500	6.52	7.960	0.546	12.74	191	49	60	28.970
75% of Pull at Maximum Power—Ten Hours 14th (5I) Gear											
86.23	5537	5.84	2719	4.84	7.654	0.618	11.27	188	41	42	28.740
50% of Pull at Maximum Power—Two Hours 14th (5I) Gear											
59.07	3672	6.03	2760	3.23	6.396	0.753	9.23	187	37	41	28.980
50% of Pull at Reduced Engine Speed—Two Hours 18th (7L) Gear											
58.75	3658	6.02	1889	3.19	4.528	0.536	12.98	184	41	47	29.000
MAXIMUM POWER IN SELECTED GEARS											
93.65	13085	2.68	2613	14.56	7th (2H) Gear			191	56	59	28.550
95.24	12100	2.95	2498	13.99	8th (3I) Gear			192	50	62	28.960
97.41	11906	3.07	2499	12.64	9th (4L) Gear			191	46	54	28.990
99.29	10127	3.68	2500	9.39	10th (5) Gear			190	51	53	28.580
100.72	9386	4.02	2500	8.61	11th (3H) Gear			190	52	54	28.570
102.62	8563	4.49	2497	7.88	12th (4I) Ge[illegible]			191	53	55	28.560
100.25	7116	5.28	2499	6.03	13th (6L) Gear			190	56	58	28.540
104.23	7377	5.30	2501	6.26	14th (5I) Gear			191	56	59	28.540
102.04	6456	5.93	2499	5.35	15th (4H) Gear			191	56	58	28.540
102.78	5580	6.91	2499	4.50	16th (5H) Gear			191	56	58	28.540
103.02	5153	7.50	2499	4.02	17th (6I) Gear			191	56	58	28.540
102.72	4867	7.91	2500	3,79	18th (7L) Gear			191	56	59	28.540
98.27	3787	9.73	2501	2.91	19th (6H) Gear			191	56	59	28.540

LUGGING ABILITY IN RATED GEAR (14th 5I)

Crankshaft Speed rpm	2501	2251	2000	1746	1493	1244
Pounds Pull	7377	7842	8390	9165	9111	8820
Increase in Pull %	0	6	14	24	24	20
Horsepower	104.23	99.28	93.80	88.79	75.40	60.99
Miles Per Hour	5.30	4.75	4.19	3.63	3.10	2.59
Slip of Drivers %	6.26	6.71	7.15	7.88	7.88	7.59

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	81.5
75% of Pull at Max. Power 10 Hours	83.5
50% of Pull at Max. Power 2 Hours	83.0
50% of Pull at Reduced Engine Speed 2 Hours	83.0
Bystander in 23rd (8I) gear	88.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 20.8-38; 10; 22	Two 20.8-38; 10; 22
Ballast	**—Liquid (each)**	1448 lb	None
	Cast Iron (each)	1000 lb	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 6; 32	Two 11.00-16; 6; 32
Ballast	**—Liquid (each)**	None	None
	Cast Iron (each)	None	None
Height of drawbar		22.5 in	22.5 in
Static weight with operator—rear		13570 lb	8675 lb
front		3920 lb	3920 lb
Total		17490 lb	12595 lb

Department of Agricultural Engineering

Dates of Test: May 7-14, 1979

Manufacturer: Massey-Ferguson Inc., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8356 **Fuel weight** 6.957 lbs/gal **Oil SAE** 20-20W **API service classification** SB/SE-CA/CD **To motor** 3.886 gal **Drained from motor** 3.224 gal **Transmission and final drive lubricant** MF Permatran **Total time engine was operated** 39.5 hours.

ENGINE Make Perkins Diesel **Type** Six cylinder vertical with turbocharger **Serial No.** TU3101N29596F **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.875" x 5.0" **Compression ratio** 16.0 to 1 **Displacement** 354 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard **Serial No.** 9R 004209 **Tread width** rear 65" to 95" front 60" to 80" **Wheel base** 105.4" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 34.2" Vertical distance above roadway 43.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission selective gear fixed ratio with partial (3) range** operator controlled power shift **Advertised speeds mph** first 1.2 second 1.7 third 1.7 fourth 2.2 fifth 2.3 sixth 2.4 seventh 3.0 eighth 3.4 ninth 3.5 tenth 4.0 eleventh 4.4 twelfth 4.9 thirteenth 5.6 fourteenth 5.6 fifteenth 6.2 sixteenth 7.2 seventeenth 7.8 eighteenth 8.2 nineteenth 9.9 twentieth 11.4 twenty-first 11.6 twenty-second 14.6 twenty-third 16.2 twenty-fourth 20.7 reverse 2.2, 3.0, 4.4, 6.2 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 135" left 135" **(on concrete surface without brake) right 180" left 180" Turning space diameter** (on concrete surface **with brake applied) right 294" left 294" (on concrete** surface without brake) right 381" left 381" **Power take-off** 1000 rpm at 2091 engine rpm and 540 rpm at 1992 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 143°F. Thirteen gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1310.**

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1311—MASSEY-FERGUSON 2745 DIESEL 24-SPEED ALSO 8-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1243 rpm)								
143.40	2600	10.275	0.498	13.96	185	62	75	28.647
Standard Power Take-off Speed (1000 rpm)—One Hour								
132.21	2092	8.583	0.452	15.40	185	61	75	28.660
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
127.13	2710	9.530	0.522	13.34	182	61	76	......
0.00	2850	4.118	......	......	173	60	74	......
65.14	2778	6.602	0.705	9.87	178	60	75	......
143.00	2601	10.289	0.501	13.90	185	60	74	......
32.92	2809	5.274	1.114	6.24	176	62	76	......
96.49	2743	7.934	0.572	12.16	181	61	75	......
Av 77.45	2748	7.291	0.655	10.62	179	61	75	28.667

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 14th (5I) Gear											
122.28	8352	5.49	2600	5.97	10.224	0.582	11.96	186	55	70	28.915
75% of Pull at Maximum Power—Ten Hours 14th (5I) Gear											
100.07	6395	5.87	2723	4.18	8.987	0.625	11.13	184	55	67	28.975
50% of Pull at Maximum Power—Two Hours 14th (5I) Gear											
68.98	4271	6.06	2770	2.85	7.349	0.741	9.39	182	54	64	29.135
50% of Pull at Reduced Engine Speed—Two Hours 17th (6I) Gear											
68.99	4271	6.06	1998	2.77	5.606	0.565	12.31	182	56	72	29.125
MAXIMUM POWER IN SELECTED GEARS											
111.30	15386	2.71	2664	14.98	7th (2H) Gear			183	49	54	29.140
118.22	14126	3.14	2600	11.87	8th (3I) Gear			184	50	55	29.140
114.26	13700	3.13	2599	14.01	9th (4L) Gear			186	55	70	28.940
120.57	11863	3.81	2598	9.27	10th (5L) Gear			187	55	68	28.960
121.28	10829	4.20	2600	7.88	11th (3H) Gear			187	55	68	28.970
124.17	9883	4.71	2599	6.95	**12th (4I) Gear**			187	55	67	28.980
122.89	8386	5.50	2599	5.71	13th (6L) Gear			187	54	66	28.990
125.17	8519	5.51	2599	5.78	**14th (5I) Gear**			187	54	67	28.970
122.74	7484	6.15	2598	5.19	15th (4H) Gear			187	56	69	28.950
123.03	6433	7.17	2600	4.28	16th (5H) Gear			187	56	70	28.940
123.37	5944	7.78	2600	4.05	17th (6I) Gear			187	55	70	28.940
122.13	5577	8.21	2599	3.59	18th (7L) Gear			187	55	70	28.940

LUGGING ABILITY IN RATED GEAR (14th 5I)

Crankshaft Speed rpm	2599	2342	2081	1812	1556	1288
Pounds Pull	8519	9189	9868	10442	10511	10076
Increase in Pull %	0	8	16	23	23	18
Horsepower	125.17	121.00	114.63	105.11	90.71	72.30
Miles Per Hour	5.51	4.94	4.36	3.77	3.24	2.69
Slip of Drivers %	5.78	6.30	6.88	7.31	7.45	7.17

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	86.0
75% of Pull at Max. Power 10 Hours	87.0
50% of Pull at Max. Power 2 Hours	85.0
50% of Pull at Reduced Engine Speed 2 Hours	82.0
Bystander in 22nd (7H) gear	96.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 18.4-38; 10; 16	Four 18.4-38; 10; 16
Ballast	—Liquid (each)	1040 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 8; 40	Two 11.00-16; 8; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	70 lb	None
Height of drawbar		22.5 in	22.5 in
Static weight with operator—rear		14520 lb	10360 lb
front		4970 lb	4830 lb
Total		19490 lb	15190 lb

Department of Agricultural Engineering

Dates of Test: May 7-16, 1979

Manufacturer: Massey-Ferguson Inc., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8356 **Fuel weight** 6.957 lbs/gal **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 5.563 gal **Drained from motor** 4.846 gal **Transmission and final drive lubricant** MF Permatran **Total time engine was operated** 38.5 hours.

ENGINE Make Perkins Diesel **Type** Eight cylinder vee **Serial No.** XC22656U514224E **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 4.25" x 4.75" **Compression ratio** 16.5 to 1 **Displacement** 539 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** four thermostats.

CHASSIS: Type standard with duals **Serial No.** 9R 004056 **Tread width** rear 65" to 129" front 60" to 80" **Wheel base** 110" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 39.8" Vertical distance above roadway 41.4" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled power shift **Advertised speeds mph** first 1.2 second 1.7 third 1.7 fourth 2.2 fifth 2.4 sixth 2.5 seventh 3.1 eighth 3.5 ninth 3.6 tenth 4.1 eleventh 4.5 twelfth 5.0 thirteenth 5.7 fourteenth 5.8 fifteenth 6.4 sixteenth 7.4 seventeenth 8.0 eighteenth 8.4 nineteenth 10.2 twentieth 11.7 twenty-first 12.0 twenty-second 15.0 twenty-third 16.6 twenty-fourth 21.3 reverse 2.2, 3.1, 4.5, 6.4 **Clutch** dual dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 152" left 152" (on concrete surface without brake) right 202" left 202" **Turning space diameter** (on concrete surface with brake applied) right 330" left 330" (on concrete surface without brake) right 428" left 428" **Power take-off** 1000 rpm at 2092 engine rpm and 540 rpm at 1992 engine rpm.

REPAIRS AND ADJUSTMENTS: Two fuel injectors were replaced during preliminary PTO test.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 159°F. Twelve gears were chosen between 15% slip and 10 mph. During the inspection excessive heat erosion signs were found on the exhaust valve side of piston number 1 and 3.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1311.

LOUIS I. LEVITICUS
Engineer-in Charge
G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1312—INTERNATIONAL 484 UTILITY DIESEL 8-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—555 rpm)								
42.42	2200	2.868	0.473	14.79	184	58	75	29.093
Standard Power Take-off Speed (540 rpm)—One Hour								
41.79	2141	2.822	0.472	14.81	184	59	75	29.095
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
37.31	2276	2.590	0.486	14.40	183	59	75	......
0.00	2415	0.922	......	......	181	58	74	......
19.27	2351	1.737	0.630	11.10	181	59	75	......
42.61	2200	2.869	0.471	14.85	185	58	74	......
9.72	2384	1.334	0.959	7.29	181	59	75	......
28.37	2311	2.136	0.527	13.28	182	59	75	......
Av 22.88	**2323**	**1.931**	**0.590**	**11.85**	**182**	**59**	**75**	**29.093**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 5th (1H) Gear											
36.00	2831	4.77	2198	5.75	2.823	0.549	12.75	188	61	82	28.625
75% of Pull at Maximum Power—Ten Hours 5th (1H) Gear											
29.97	2238	5.02	2282	4.36	2.420	0.565	12.39	186	67	84	28.688
50% of Pull at Maximum Power—Two Hours 5th (1H) Gear											
20.89	1507	5.20	2327	2.90	1.966	0.658	10.63	183	66	69	28.685
50% of Pull at Reduced Engine Speed—Two Hours 6th (2H) Gear											
20.70	1494	5.20	1694	2.87	1.716	0.580	12.07	186	70	76	28.690
MAXIMUM POWER IN SELECTED GEARS											
23.93	5500	1.63	2310	14.38	2nd (2L) Gear			185	62	84	28.650
36.20	4236	3.20	2198	8.81	3rd (3L) Gear			188	62	82	28.670
36.66	3239	4.24	2200	6.29	4th (4L) Gear			188	62	82	28.680
38.06	2988	4.78	2205	5.84	5th (1H) Gear			187	62	83	28.700
36.83	2068	6.68	2199	3.92	6th (2H) Gear			188	62	83	28.660

LUGGING ABILITY IN RATED GEAR (5th 1H)

Crankshaft Speed rpm	2205	1980	1757	1536	1333	1110
Pounds Pull	2988	3116	3302	3364	3364	3135
Increase in Pull %	0	4	11	13	13	5
Horsepower	38.06	35.56	33.31	29.58	25.69	20.02
Miles Per Hour	4.78	4.28	3.78	3.30	2.86	2.39
Slip of Drivers %	5.84	6.01	6.35	6.68	6.46	6.23

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	96.5
75% of Pull at Max. Power 10 Hours	96.0
50% of Pull at Max. Power 2 Hours	97.0
50% of Pull at Reduced Engine Speed 2 Hours	94.0
Bystander in 8th (4H) gear	84.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 14.9-28; 6; 16	Two 14.9-28; 6; 16
Ballast	—Liquid (each)	700 lb	None
	Cast Iron (each)	578 lb	None
Front Tires	—No., size, ply & psi	Two 9.5L-15; 6; 36	Two 9.5L-15; 6; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	77 lb	None
Height of drawbar		12.5 in	12.5 in
Static Weight with operator—rear		5710 lb	3155 lb
	front	2000 lb	1845 lb
	Total	7710 lb	5000 lb

Department of Agricultural Engineering

Dates of Test: May 22-31, 1979

Manufacturer: International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil SAE** 30 **API service classification** SC-SE/CA-CD **To motor** 1.600 gal **Drained from motor** 1.568 gal **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 36.5 hours.

ENGINE Make International Diesel **Type** 3 cylinder vertical **Serial No.** 179DT2D372290* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 3.875" x 5.06" **Compression ratio** 15.0 to 1 **Displacement** 179 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** B480003-B000956-X- **Tread width** rear 52" to 76" front 52" to 72" **Wheel base** 72.8" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 26.9" Vertical distance above roadway 29.7" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.3 second 1.8 third 3.6 fourth 4.6 fifth 5.1 sixth 7.0 seventh 13.7 eighth 17.6 reverse 1.6, 2.2, 4.3, 5.5 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 108" left 108"(on concrete surface without brake) right 120" left 120"**Turning space diameter** (on concrete surface with brake applied) right 226" left 226" (on concrete surface without brake) right 250" left 250" **Power take-off** 540 rpm at 2141 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 145°F. Five gears were chosen betwen tire tangential pull limit and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1312.**

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1313—INTERNATIONAL 584 UTILITY DIESEL
ALSO INTERNATIONAL 584 ROWCROP DIESEL
8-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer Inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—580 rpm)								
52.54	2300	3.489	0.465	15.06	188	61	75	29.137
Standard Power Take-off Speed (540 rpm)—One Hour								
50.96	2140	3.345	0.459	15.23	190	62	77	29.140
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
46.33	2386	3.101	0.468	14.94	184	62	78	......
0.00	2557	1.081	......	......	178	63	80	......
23.98	2470	2.050	0.598	11.70	182	63	80	......
52.81	2300	3.478	0.461	15.18	190	64	80	......
12.14	2503	1.565	0.902	7.75	178	64	80	......
35.44	2430	2.556	0.505	13.86	184	63	80	.....
Av 28.45	**2441**	**2.305**	**0.567**	**12.34**	**183**	**63**	**80**	**29.123**

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer Inches of Mercury
Maximum Available Power—Two Hours 5th (1H) Gear											
46.73	3451	5.08	2300	5.88	3.485	0.522	13.41	187	55	60	28.985
75% of Pull at Maximum Power—Ten Hours 5th (1H) Gear											
37.11	2573	5.41	2397	4.04	2.866	0.540	12.95	186	67	80	28.562
50% of Pull at Maximum Power—Two Hours 5th (1H) Gear											
25.99	1734	5.62	2456	2.76	2.341	0.630	11.10	182	71	85	28.490
50% of Pull at Reduced Engine Speed—Two Hours 6th (2H) Gear											
25.89	1726	5.62	1788	2.66	1.948	0.526	13.29	183	71	84	28.460
MAXIMUM POWER IN SELECTED GEARS											
32.36	6859	1.77	2410	12.91	2nd (2L) Gear			183	53	57	28.990
46.98	5141	3.43	2299	8.78	3rd (3L) Gear			187	54	59	28.980
46.26	3849	4.51	2299	6.44	4th (4L) Gear			187	54	59	28.990
47.47	3513	5.07	2297	6.01	5th (1H) Gear			187	53	57	28.990
47.47	2508	7.10	2297	4.36	6th (2H) Gear			186	55	60	28.980

LUGGING ABILITY IN RATED GEAR (5th 1H)

Crankshaft Speed rpm	2297	2070	1834	1622	1391	1152
Pounds Pull	3513	3690	3886	4040	4210	4150
Increase in Pull %	0	5	11	15	20	18
Horsepower	47.47	44.81	41.76	38.28	33.93	27.80
Miles Per Hour	5.07	4.55	4.03	3.55	3.02	2.51
Slip of Drivers %	6.01	6.25	6.62	6.87	7.11	7.11

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	96.5
75% of Pull at Max. Power 10 Hours	96.0
50% of Pull at Max. Power 2 Hours	96.5
50% of Pull at Reduced Engine Speed 2 Hours	94.0
Bystander in 8th (4H) gear	85.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 16.9-30; 6; 16	Two 16.9-30; 6; 16
Ballast	—Liquid (each)	935 lb	None
	Cast Iron (each)	605 lb	None
Front Tires	—No., size, ply & psi	Two 9.5L-15; 6; 36	Two 9.5L-15; 6; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	52 lb	None
Height of drawbar		15.5 in	15.5 in
Static weight with operator—rear		6750 lb	3670 lb
front		2100 lb	1995 lb
Total		8850 lb	5665 lb

Department of Agricultural Engineering

Dates of Test: May 24 to June 11, 1979

Manufacturer: International Harvester Co., 401 North Michigan Ave., Chicago, Illinois 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil SAE** 30 **API service classification** SC-SE/CA-CD **To motor** 2.056 gal **Drained from motor** 1.949 gal **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 36.0 hours.

ENGINE Make International Diesel **Type** Four cylinder vertical **Serial No.** DT2D313257* **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.875" x 4.38" **Compression ratio** 15.3 to 1 **Displacement** 206 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type Standard **Serial No.** B500003-B001330-X- **Tread width** rear 56" to 76" front 48" to 80" **Wheel base** 77.7" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 27.4" Vertical distance above roadway 30.7" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.4 second 1.9 third 3.7 fourth 4.8 fifth 5.4 sixth 7.4 seventh 14.3 eighth 18.4 reverse 1.7, 2.3, 4.5, 5.7 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 112" left 112" (on concrete surface without brake) right 122" left 122" **Turning space diameter** (on concrete surface with brake applied) right 235" left 235" (on concrete surface without brake) right 256" left 256" **Power take-off** 540 rpm at 2140 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 148°F. Five gears were chosen between tire tangential pull limit and 10 mph. During final inspection, slight pitting of the engine exhaust valve faces was noted.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1313.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1314—INTERNATIONAL 684 UTILITY DIESEL
ALSO INTERNATIONAL 684 ROWCROP DIESEL
8-SPEED

POWER TAKE-OFF PERFORMANCE

		Crank-shaft	Fuel Consumption			Temperature Degrees F			
	Hp	speed rpm	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—606 rpm)									
	62.52	2400	4.204	0.470	14.87	191	65	75	28.790
Standard Power Take-off Speed (540 rpm)—One Hour									
	58.75	2140	3.778	0.450	15.55	192	64	75	28.815
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	54.64	2468	3.706	0.474	14.74	188	64	75	......
	0.00	2640	1.274	......	......	178	64	74	......
	28.18	2545	2.423	0.601	11.63	182	64	75	......
	62.70	2400	4.207	0.469	14.90	192	65	75	......
	14.28	2578	1.866	0.914	7.65	179	64	75	......
	41.66	2512	3.028	0.508	13.76	186	64	74	......
Av	**33.58**	**2524**	**2.751**	**0.573**	**12.21**	**184**	**64**	**75**	**28.810**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 5th (1H) Gear											
54.56	3861	5.30	2400	5.84	4.110	0.527	13.27	193	58	76	29.115
75% of Pull at Maximum Power—Ten Hours 5th (1H) Gear											
43.84	2979	5.52	2454	4.08	3.367	0.537	13.02	189	58	77	29.017
50% of Pull at Maximum Power—Two Hours 5th (1H) Gear											
30.44	1989	5.74	2516	2.70	2.698	0.620	11.28	185	60	79	29.080
50% of Pull at Reduced Engine Speed—Two Hours 6th (2H) Gear											
30.61	1993	5.76	1836	2.60	2.287	0.523	13.38	186	59	78	29.045
MAXIMUM POWER IN SELECTED GEARS											
33.94	6858	1.86	2497	11.50	2nd (2L) Gear			186	55	66	29.140
54.45	5765	3.54	2398	9.37	3rd (3L) Gear			194	58	72	29.140
54.13	4324	4.69	2398	6.58	4th (4L) Gear			193	57	71	29.140
55.92	3967	5.29	2398	5.97	5th (1H) Gear			192	55	66	29.140
55.78	2824	7.41	2400	4.07	6th (2H) Gear			192	58	73	29.130

LUGGING ABILITY IN RATED GEAR (5th 1H)

Crankshaft Speed rpm	2398	2159	1923	1683	1435	1202
Pounds Pull	3967	4177	4219	4422	4399	4345
Increase in Pull %	0	5	6	11	11	10
Horsepower	55.92	52.78	47.43	43.31	36.77	30.44
Miles Per Hour	5.29	4.74	4.22	3.67	3.13	2.63
Slip of Drivers %	5.97	6.58	6.58	6.82	6.82	6.82

TRACTOR SOUND LEVEL WITHOUT CAB	**dB(A)**
Maximum Available Power 2 Hours	97.0
75% of Pull at Max. Power 10 Hours	97.5
50% of Pull at Max. Power 2 Hours	97.0
50% of Pull at Reduced Engine Speed 2 Hours	93.5
Bystander in 8th (4H) gear	86.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Two 16.9-30; 6; 16	Two 16.9-30; 6; 16
Ballast	—Liquid (each)	935 lb	None
	Cast Iron (each)	953 lb	None
Front Tires	—No., size, ply & psi	Two 9.5L-15; 6; 36	Two 9.5L-15; 6; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	25 lb	None
Height of drawbar		14.5 in	14.5 in
Static weight with operator—rear		7710 lb	3935 lb
	front	1950 lb	1900 lb
	Total	9660 lb	5835 lb

Department of Agricultural Engineering

Dates of Test: May 24 to June 4, 1979

Manufacturer: International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil SAE** 30 **API service classification** SC-SE/CA-CD **To motor** 2.063 gal **Drained from motor** 2.031 gal **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 33.0 hours.

ENGINE Make International Diesel **Type** Four cylinder vertical **Serial No.** DT2D472004* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.875" x 5.06" **Compression ratio** 15.0 to 1 **Displacement** 239 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type Standard **Serial No.** B510005-B001149-X- **Tread width** rear 52" to 76" front 54" to 74" **Wheel base** 88" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 29.1" Vertical distance above roadway 30.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.5 second 2.0 third 3.9 fourth 5.0 fifth 5.6 sixth 7.7 seventh 14.9 eighth 19.2 **reverse 1.8, 2.4, 4.7, 6.0 Clutch single dry disc operated** by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 133" left 133" (on concrete surface without brake) right 153" left 153" **Turning space diameter** (on concrete surface with brake applied) right 278" left 278" (on concrete surface without brake) right 318" left 318" **Power take-off** 540 rpm at 2140 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 144°F. Five gears were chosen between tire tangential pull limit and 10 mph. During final inspection, slight pitting of the engine exhaust valve faces was noted.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1314.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1315—INTERNATIONAL 784 ROWCROP DIESEL 8-SPEED

POWER TAKE-OFF PERFORMANCE—540 RPM

	Crank-shaft	Fuel Consumption			Temperature Degrees F			
Hp	speed rpm	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—605 rpm)								
65.47	2400	4.267	0.456	15.34	190	59	75	29.050
Standard Power Take-off Speed (504 rpm)—One Hour								
61.28	2140	3.907	0.446	15.68	190	59	75	29.045
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
57.64	2484	3.830	0.465	15.05	186	59	75	......
0.00	2623	1.321	......	......	178	60	75	......
29.74	2562	2.548	0.599	11.67	182	59	74	......
65.64	2400	4.327	0.461	15.17	190	60	75	......
14.99	2587	1.947	0.909	7.70	179	59	75	......
43.98	2530	3.139	0.499	14.01	184	59	74	......
Av 35.33	**2531**	**2.852**	**0.565**	**12.39**	**184**	**59**	**75**	**29.047**

OPTIONAL POWER TAKE-OFF—1000 RPM

	Crank-shaft	Fuel Consumption			Temperature Degrees F			
Hp	speed rpm	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1096rpm)								
67.48	2400	4.272	0.443	15.80	189	60	75	29.060
Standard Power Take-off Speed (1000 rpm)—One Hour								
64.09	2190	3.990	0.435	16.06	191	60	75	29.045
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
59.40	2486	3.830	0.451	15.51	186	60	75	......
0.00	2622	1.330	......	......	179	61	76	......
30.64	2564	2.548	0.582	12.03	184	60	76	......
66.94	2400	4.280	0.447	15.64	190	61	77	......
15.51	2592	1.939	0.874	8.00	180	61	77	......
45.39	2532	3.169	0.488	14.32	186	62	78	......
Av 36.31	**2533**	**2.849**	**0.549**	**12.75**	**184**	**61**	**76**	**29.017**

DRAWBAR PERFORMANCE

					Fuel Consumption			Temp Degrees F			
Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 5th (1H) Gear											
56.83	4115	5.18	2399	5.96	4.289	0.528	13.25	191	58	63	28.790
75% of Pull at Maximum Power—Ten Hours 5th (1H) Gear											
46.19	3182	5.44	2484	4.55	3.617	0.548	12.77	187	52	63	28.999
50% of Pull at Maximum Power—Two Hours 5th (1H) Gear											
32.23	2144	5.64	2534	3.12	2.913	0.632	11.07	185	57	61	28.805
50% of Pull at Reduced Engine Speed—Two Hours 6th (2H) Gear											
32.00	2125	5.65	1955	3.08	2.538	0.555	12.61	185	57	63	28.815
MAXIMUM POWER IN SELECTED GEARS											
41.52	8105	1.92	2487	13.75	2nd (2L) Gear			186	49	56	29.130
55.45	6630	3.14	2400	10.23	3rd (3L) Gear			192	59	63	28.780
56.60	4834	4.39	2400	6.79	4th (4L) Gear			192	60	64	28.750
58.65	4244	5.18	2402	6.09	5th (1H) Gear			190	58	62	28.790
58.36	3202	6.83	2402	4.44	6th (2H) Gear			192	58	63	28.790

LUGGING ABILITY IN RATED GEAR (5th 1H)

Crankshaft Speed rpm	2402	2157	1924	1694	1432	1196
Pounds Pull	4244	4390	4514	4664	4811	4633
Increase in Pull %	0	3	6	10	13	9
Horsepower	58.65	54.40	46.69	45.11	39.23	31.64
Miles Per Hour	5.18	4.65	4.13	3.63	3.06	2.56
Slip of Drivers %	6.09	6.15	6.54	6.79	6.92	6.67

Department of Agricultural Engineering

Dates of Test: May 24 to June 2, 1979

Manufacturer: International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil SAE** 30 **API service classification** SC-SE/CA-CD **To motor** 2.034 gal **Drained from motor** 1.734 gal **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 44.0 hours.

ENGINE Make International Diesel **Type** Four cylinder vertical **Serial No.** 246D12D114055* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.937" x 5.062" **Compression ratio** 15.5 to 1 **Displacement** 246 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Oil cooler** radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** B5300004-B001238-X- **Tread width** rear 52" to 76" front 54" to 74" **Wheel base** 88" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 28.1" Vertical distance above roadway 31.6" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.7 second 2.1 third 3.5 fourth 4.7 fifth 5.5 sixth 7.1 seventh 11.6 eighth 15.6 reverse 2.5, 3.2, 5.2, 7.1 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 129" left 129" (on concrete surface without brake) right 153" left 153" **Turning space diameter** (on concrete surface with brake applied) right 268" left 268" (on concrete surface without brake) right 317" left 317" **Power take-off** 540 rpm at 2140 engine rpm and 1000 rpm at 2190 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 148°F. Five gears were chosen between tire tangential pull limit and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1315.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

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NEBRASKA TRACTOR TEST 1315—INTERNATIONAL 784 ROWCROP DIESEL 8-SPEED

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TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	97.5
75% of Pull at Max. Power 10 Hours	97.5
50% of Pull at Max. Power 2 Hours	97.5
50% of Pull at Reduced Engine Speed 2 Hours	94.5
Bystander in 8th (4H) gear	87.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Two 18.4-30; 6; 16	Two 18.4-30; 6; 16
Ballast	—Liquid (each)	1160 lb	None
	Cast Iron (each)	740 lb	None
Front Tires	—No., size, ply & psi	Two 9.5L-15; 6; 36	Two 9.5L-15; 6; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	15 lb	None
Height of drawbar		15.5 in	15.5 in
Static weight with operator—rear		7970 lb	4170 lb
	front	1950 lb	1920 lb
	Total	9920 lb	6090 lb

NEBRASKA TRACTOR TEST 1316—
INTERNATIONAL HYDRO 84 UTILITY DIESEL
ALSO INTERNATIONAL HYDRO 84 ROWCROP DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—584 rpm)								
58.73	2401	4.307	0.513	13.64	180	60	75	29.007
Standard Power Take-off Speed (540 rpm)—One Hour								
56.68	2222	4.044	0.499	14.01	180	60	75	29.010
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
51.56	2479	3.903	0.530	13.21	172	60	75	......
0.00	2622	1.643	......	......	156	59	75	......
26.58	2560	2.741	0.721	9.70	161	60	76	......
59.18	2400	4.327	0.512	13.67	178	59	75	......
13.45	2590	2.209	1.149	6.09	161	59	75	......
39.38	2526	3.285	0.584	11.99	168	59	75	......
Av 31.69	**2529**	**3.018**	**0.666**	**10.50**	**166**	**59**	**75**	**29.000**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours, Speed Setting—6.0 MPH Hi Range											
42.90	2733	5.89	2401	4.43	4.235	0.691	10.13	195	65	78	28.530
75% of Pull at Maximum Power—Two Hours, Speed Setting—6.0 MPH Hi Range											
35.15	2032	6.49	2495	2.99	3.581	0.713	9.82	177	65	83	28.679

Department of Agricultural Engineering

Dates of Test: May 25 to June 6, 1979

Manufacturer: International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil** SAE 30 **API service classification** SC-SE/CA-CD **To motor** 2.273 gal **Drained from motor** 1.952 gal **Transmission and final drive lubricant** I.H. Hytral fluid **Total time engine was operated** 38.5 hours.

ENGINE Make International Diesel **Type** Four cylinder vertical **Serial No.** 246DT20114054* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.937" x 5.062" **Compression ratio** 15.5 to 1 **Displacement** 246 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Oil cooler** radiator for hydraulic and transmission fluid **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type standard **Serial No.** B600003-B00719-X- **Tread width** rear 52" to 76" front 54" to 74" **Wheel base** 88" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 30.1" Vertical distance above roadway 30.2" Horizontal distance from center of rear wheel tread 0"

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NEBRASKA TRACTOR TEST 1316—
INTERNATIONAL HYDRO 84 UTILITY DIESEL
ALSO INTERNATIONAL HYDRO 84 ROWCROP DIESEL

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50% of Pull at Maximum Power—Two Hours, Speed Setting—6.0 MPH Hi Range

25.50	1365	7.01	2538	1.94	3.056	0.838	8.34	189	70	89	28.640

**50% of Pull at Reduced Engine Speed—Two Hours,
Speed Setting—11.1 MPH Hi Range at 2400 Engine RPM**

25.24	1361	6.95	1496	1.81	2.448	0.678	10.31	210	68	92	28.620

**MAXIMUM POWER IN SELECTED GEARS
The variable drive control was set by mfr. to give the travel speeds shown)**

41.41	6572	2.36	2402	13.71	Lo Range	184	64	71	28.560
41.57	5145	3.03	2401	9.52	Lo Range	210	68	80	28.660
41.53	4371	3.56	2400	7.64	Lo Range	209	67	79	28.660
41.14	3822	4.04	2400	6.41	Lo Range	210	67	78	28.660
37.28	3134	4.46	2400	5.20	Hi Range	208	66	76	28.660
41.24	3073	5.03	2399	4.89	Hi Range	202	64	74	28.660
42.67	2904	5.51	2399	4.71	Hi Range	197	63	71	28.660
43.35	2699	6.02	2401	4.27	Hi Range	195	60	67	28.660
43.14	2490	6.50	2401	3.90	Hi Range	207	69	82	28.650
43.49	2337	6.98	2403	3.58	Hi Range	207	70	84	28.650
43.59	2152	7.60	2401	3.20	Hi Range	206	70	85	28.650
43.37	1977	8.23	2399	2.88	Hi Range	207	71	87	28.650

LUGGING ABILITY IN SPEED SETTING—6.0 MPH HI RANGE

Crankshaft Speed rpm	2401	2159	1921	1676	1439	1198
Pounds Pull	2699	2884	2991	3188	3168	3124
Increase in Pull %	0	7	11	18	17	16
Horsepower	43.35	40.88	37.04	33.01	27.79	21.71
Miles Per Hour	6.02	5.32	4.64	3.88	3.29	2.61
Slip of Drivers %	4.27	4.77	4.89	5.26	5.26	5.26

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	99.0
75% of Pull at Max. Power 10 Hours	98.5
50% of Pull at Max. Power 2 Hours	99.5
50% of Pull at Reduced Engine Speed 2 Hours	95.5
Bystander in Hi Range	88.0

to the right/left **Hydraulic control system** direct engine drive **Transmission** Infinitely variable hydrostatic using variable displacement pump and motor. A range transmission provides Hi and Lo range **Advertised speeds mph** Lo range 0-6.9 Hi range 0-18.9 reverse Lo range 0-3.0, Hi range 0-8.0 **Clutch** none—hydrostatic drive can be controlled by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 134" left 134" (on concrete surface without brake) right 153" left 153" **Turning space diameter** (on concrete surface with brake applied) right 278" left 278"(on concrete surface without brake) right 316" left 316" **Power take-off** 540 rpm at 2222 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 152°F. Twelve travel speeds were chosen between tire tangential pull limit and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1316.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

**The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director**

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 16.9-28; 6; 16	Two 16.9-28; 6; 16
Ballast	—Liquid (each)	900 lb	None
	Cast Iron (each)	625 lb	None
Front Tires	—No., size, ply & psi	Two 9.5L-15; 6; 36	Two 9.5L-15; 6; 36
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	32 lb	None
Height of drawbar		14.5 in	14.5 in
Static weight with operator—rear		7030 lb	3980 lb
	front	2090 lb	2025 lb
	Total	9120 lb	6005 lb

NEBRASKA TRACTOR TEST 1317—INTERNATIONAL 4786 DIESEL 10-SPEED

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption		Hp-hr per gal	Temp Degrees F			Barometer inches of Mercury
					Gal per hr	Lb per hp-hr		Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 6th (3H) Gear											
258.20	15680	6.18	2600	3.60	20.175	0.547	12.80	188	70	29.100	
75% of Pull at Maximum Power—Ten Hours 6th (3H) Gear											
210.04	12086	6.52	2713	2.51	17.623	0.587	11.92	183	56	72	29.003
50% of Pull at Maximum Power—Two Hours 6th (3H) Gear											
144.70	8051	6.74	2781	1.70	14.671	0.709	9.86	177	54	72	29.060
50% of Pull at Reduced Engine Speed—Two Hours 8th (4H) Gear											
144.00	8018	6.73	1680	1.63	10.400	0.505	13.85	182	55	73	29.040
MAXIMUM POWER IN SELECTED GEARS											
192.11	33468	2.15	2710	14.78	2nd (1H) Gear			175	60	68	28.740
227.87	31773	2.69	2610	14.12	3rd (2L) Gear			182	60	71	28.750
254.08	25783	3.70	2599	6.89	4th (2H) Gear			186	51	65	29.110
265.55	20790	4.79	2599	4.79	5th (3L) Gear			186	52	66	29.110
265.41	16116	6.18	2600	3.52	6th (3H) Gear			186	50	63	29.130
265.02	12263	8.10	2598	2.60	7th (4L) Gear			186	51	65	29.110

LUGGING ABILITY IN RATED GEAR (6th 3H)

Crankshaft Speed rpm	2600	2338	2079	1819	1550	1297
Pounds Pull	16116	18124	19897	20696	20053	17821
Increase in Pull %	0	12	23	28	24	11
Horsepower	265.41	266.94	259.32	235.36	194.44	145.47
Miles Per Hour	6.18	5.52	4.89	4.26	3.64	3.06
Slip of Drivers %	3.52	4.12	4.42	4.87	4.72	4.12

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	82.5
75% of Pull at Max. Power 10 Hours	81.0
50% of Pull at Max. Power 2 Hours	80.5
50% of Pull at Reduced Engine Speed 2 Hours	76.5
Bystander in 10th (5H) gear	95.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 23.1-30; 8; 14	Four 23.1-30; 8; 14
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	48 lb	None
Front Tires	—No., size, ply & psi	Four 23.1-30; 8; 14	Four 23.1-30; 8; 14
Ballast	—Liquid (each)	1980 lb	None
	Cast Iron (each)	None	None
Height of drawbar		20.0 in	20.0 in
Static weight with operator	—rear	14150 lb	13960 lb
	front	20200 lb	16240 lb
	Total	34350 lb	30200 lb

Department of Agricultural Engineering

Dates of Test: May 23-29, 1979

Manufacturer: International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil SAE** 30 **API service classification** SC-SE/CA-CD **To motor** 5.447 gal **Drained from motor** 4.711 gal **Transmission and final drive lubricant** I.H. Hytran fluid **Total time engine was operated** 29.0 hours.

ENGINE Make International Diesel **Type** Eight cylinder vee with turbocharger **Serial No.** 800TT2U-005562* **Crankshaft** lengthwise **Rated rpm** 2600 **Bore and stroke** 5.313" x 4.500" **Compression ratio** 15.6 to 1 **Displacement** 798 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic, transmission and dropbox oil **Fuel filter** two paper cartridges **Muffler** none **Cooling medium temperature control** two thermostats.

CHASSIS: Type Four wheel drive with duals **Serial No.** 2990004U000665 **Tread width** rear 68.1" to 125.1" front 68.1" to 125.1" **Wheel base** 118" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 63.4" Vertical distance above roadway 43.8" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.8 second 2.3 third 3.0 fourth 3.8 fifth 4.8 sixth 6.1 seventh 8.0 eighth 10.1 ninth 12.7 tenth 16.1 reverse 1.8, 2.3 **Clutch** double dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by one foot pedal **Steering** hydrostatic **Turning radius** (on concrete surface without brake) right 249" left 249" **Turning space diameter** (on concrete surface without brake) right 550" left 550" **Power take-off** none.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 144°F. Six gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1317.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
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NEBRASKA TRACTOR TEST 1318—WHITE 4-210 FIELD BOSS DIESEL 18-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1000 rpm)								
182.44	2800	12.792	0.490	14.26	181	66	75	28.787
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
158.80	2869	11.065	0.487	14.35	178	66	75	......
0.00	3014	4.482	......	......	174	66	75	......
81.81	2952	7.514	0.642	10.89	177	66	76	......
183.81	2801	12.755	0.485	14.41	182	66	73	......
41.31	2981	5.927	1.004	6.97	175	66	76	......
120.84	2912	9.135	0.529	13.23	178	67	76	......
Av 97.76	**2921**	**8.480**	**0.607**	**11.53**	**177**	**66**	**75**	**28.783**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 11th (4D) Gear											
158.77	10120	5.88	2799	3.06	12.866	0.567	12.34	190	74	82	28.740
75% of Pull at Maximum Power—Ten Hours 11th (4D) Gear											
126.70	7744	6.14	2896	2.31	10.472	0.578	12.10	183	72	82	28.554
50% of Pull at Maximum Power—Two Hours 11th (4D) Gear											
86.65	5179	6.27	2944	1.80	8.452	0.682	10.25	180	62	72	28.735
50% of Pull at Reduced Engine Speed—Two Hours 15th (5O) Gear											
86.28	5151	6.28	1680	1.63	6.040	0.490	14.28	181	65	79	28.775
MAXIMUM POWER IN SELECTED GEARS											
140.19	22934	2.29	2818	14.91	2nd (1D) Gear			183	59	69	28.710
145.79	21369	2.56	2798	11.33	3rd (2U) Gear			186	75	85	28.730
151.84	19316	2.95	2798	7.65	4th (1O) Gear			187	74	84	28.740
158.09	18184	3.26	2798	6.64	5th (2D) Gear			186	74	83	28.740
157.12	16219	3.63	2797	5.47	6th (3U) Gear			187	74	83	28.740
157.93	14933	3.97	2799	4.79	7th (2O) Gear			186	70	78	28.760
161.70	13615	4.45	2798	4.19	8th (3D) Gear			186	70	77	28.760
161.26	12521	4.83	2800	3.72	9th (4U) Gear			185	70	77	28.760
158.34	11050	5.37	2800	3.18	10th (3O) Gear			185	70	77	28.760
162.25	10333	5.89	2800	3.02	11th (4D) Gear			185	67	71	28.770
155.40	8235	7.08	2800	2.47	12th (4O) Gear			186	73	81	28.750
157.76	8220	7.20	2799	2.31	13th (5U) Gear			186	74	82	28.750
158.75	6807	8.75	2798	1.84	14th (5D) Gear			186	74	82	28.750

LUGGING ABILITY IN RATED GEAR (11th 4D)

Crankshaft Speed rpm	2800	2526	2248	1963	1680	1395	1113
Pounds Pull	10333	11357	12234	12831	13449	13932	13695
Increase in Pull %	0	10	18	24	30	35	33
Horsepower	162.25	160.34	153.26	139.95	125.29	107.49	84.38
Miles Per Hour	5.89	5.29	4.70	4.09	3.49	2.89	2.31
Slip of Drivers %	3.02	3.34	3.49	3.96	4.11	4.41	4.26

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	78.5
75% of Pull at Max. Power 10 Hours	81.0
50% of Pull at Max. Power 2 Hours	81.5
50% of Pull at Reduced Engine Speed 2 Hours	79.5
Bystander in 18th (6O) gear	93.0

TIRES, BALLAST AND WEIGHT		**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 18.4-38; 8; 12
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Front Tires	—No., size, ply & psi	Four 18.4-38; 8; 12
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Height of drawbar		22 in
Static weight with operator	—rear	9660 lb
	front	14075 lb
	total	23735 lb

Department of Agricultural Engineering

Dates of Test: June 12-20, 1979

Manufacturer: White Farm Euipment Co., 2625 Butterfield Road, Oakbrook, Illinois 60521

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8401 **Fuel weight** 6.995 lbs/gal **Oil SAE** 10W-30 **API service classification** SD-SE/CC-CD **To motor** 4.359 gal **Drained from motor** 1.867 gal **Transmission and final drive lubricant** Universal Tractor Hydraulic-Transmission Fluid **Total time engine was operated** 36.0 hours.

ENGINE Make Caterpillar Diesel **Type** Eight cylinder vee **Serial No.** 90N36922 **Crankshaft** lengthwise **Rated rpm** 2800 **Bore and stroke** 4.5" x 5.0" **Compression ratio** 16.5 to 1 **Displacement** 636 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge **Muffler** underhood **Cooling medium temperature control** two thermostats.

CHASSIS: Type Four wheel drive with duals **Serial No.** 275804-418 **Tread width** rear 63" to 126" front 63" to 126" **Wheel base** 117.8" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 72.4" Vertical distance above roadway 43.7" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled power shift **Advertised speeds mph** first 2.2 second 2.6 third 2.8 fourth 3.2 fifth 3.4 sixth 3.8 seventh 4.1 eighth 4.6 ninth 5.0 tenth 5.5 eleventh 6.0 twelfth 7.2 thirteenth 7.3 fourteenth 8.8 fifteenth 10.5 sixteenth 12.7 seventeenth 15.2 eighteenth 18.3 reverse 2.5, 3.1, 3.7, 4.4, 5.3, 6.4 **Clutch** dual dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 210" left 210" **Turning space diameter** (on concrete surface without brake) right 450" left 450"**Power take-off** 1000 rpm at 2800 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 162°F. Thirteen gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1318.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

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H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1319—INTERNATIONAL 3388 DIESEL 16-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1159 rpm)								
130.61	2400	8.381	0.449	15.58	189	67	75	28.850
Standard Power Take-off Speed (1000 rpm)—One Hour								
128.59	2070	7.631	0.415	16.85	189	66	75	28.860
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
115.24	2494	7.779	0.472	14.82	187	67	76	......
0.00	2640	3.013	......	......	182	66	75	......
59.44	2574	5.426	0.639	10.95	184	67	75	......
130.88	2400	8.361	0.447	15.65	188	67	75	......
30.26	2607	4.166	0.964	7.27	183	67	75	......
87.98	2534	6.583	0.524	13.36	186	67	75	......
Av 70.63	2542	5.888	0.584	12.00	185	67	75	28.873

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (4LoDD) Gear											
111.75	6864	6.10	2400	2.30	8.268	0.518	13.52	190	69	77	28.855
75% of Pull at Maximum Power—Ten Hours 8th (4LoDD) Gear											
89.92	5232	6.44	2519	1.75	7.389	0.575	12.17	187	70	77	28.793
50% of Pull at Maximum Power—Two Hours 8th (4LoDD) Gear											
61.24	3483	6.59	2568	1.37	6.071	0.694	10.09	185	65	71	28.870
50% of Pull at Reduced Engine Speed—Two Hours 11th (2HiTA) Gear											
61.80	3508	6.61	1501	1.24	4.554	0.516	13.57	186	72	78	28.900
MAXIMUM POWER IN SELECTED GEARS											
93.58	16764	2.09	2490	11.54	2nd (1LoDD) Gear			186	63	66	28.870
110.65	14552	2.85	2402	6.83	3rd (2LoTA) Gear			189	68	76	28.880
112.14	12358	3.40	2401	4.96	4th (2LoDD) Gear			190	68	77	28.880
113.37	9765	4.35	2401	3.34	5th (3LoTA) Gear			189	66	73	28.870
113.40	8306	5.12	2400	2.76	6th (3LoDD) Gear			190	66	73	28.870
113.16	8166	5.20	2399	2.76	7th (4LoTA) Gear			190	67	74	28.860
113.79	6983	6.11	2400	2.35	8th (4LoDD) Gear			190	67	74	28.860
114.42	6430	6.67	2399	2.18	9th (1HiTA) Gear			190	67	74	28.880
113.07	5413	7.83	2398	1.67	10th (1HiDD) Gear			190	67	75	28.880

LUGGING ABILITY IN RATED GEAR (8th 4LoDD)						
Crankshaft Speed rpm	2400	2162	1920	1684	1445	1203
Pounds Pull	6983	7835	8323	8682	8305	7551
Increase in Pull %	0	12	19	24	19	8
Horsepower	113.79	114.61	107.91	98.55	81.00	61.48
Miles Per Hour	6.11	5.49	4.86	4.26	3.66	3.05
Slip of Drivers %	2.35	2.68	2.68	3.01	2.85	2.51

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	78.0
75% of Pull at Max. Power 10 Hours	78.5
50% of Pull at Max. Power 2 Hours	78.0
50% of Pull at Reduced Engine Speed 2 Hours	75.5
Bystander in 15th (4HiTA) gear	87.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Two 18.4R38; 8; 16	Two 18.4R38; 8; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	130 lb	None
Front Tires	—No., size, ply & psi	Two 18.4R38; 8; 16	Two 18.4R38; 8; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	85 lb	None
Height of drawbar		20.5 in	20.5 in
Static weight with operator	—rear	8080 lb	7820 lb
	front	9770 lb	9600 lb
	Total	17850 lb	17420 lb

Department of Agricultural Engineering

Dates of Test: August 21 to 27, 1979

Manufacturer: International Harvester Company, 401 North Michigan Avenue, Chicago, IL 60611

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8407 **Fuel weight** 7.000 lbs/gal **Oil** SAE 30 **API service classification** SC/SE-CA/CD **To motor** 3.932 gal **Drained from motor** 3.723 gal **Transmission and final drive lubricant** I.H. Hytran Fluid **Total time engine was operated** 37.0 hours.

ENGINE **Make** International Diesel **Type** 6 cylinder vertical with turbocharger **Serial No.** 437TT2U101187* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.300" x 5.000" **Compression ratio** 16.0 to 1 **Displacement** 436 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** four wheel drive **Serial No.** 2880003U8820* **Tread width** rear 59.8" to 104" front 59.8" to 104" **Wheel base** 110" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 60.9" Vertical distance above roadway 41.9" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph** first 1.8 second 2.2 third 2.9 fourth 3.4 fifth 4.3 sixth 5.0 seventh 5.1 eighth 5.9 ninth 6.5 tenth 7.6 eleventh 10.1 twelfth 11.9 thirteenth 14.9 fourteenth 17.4 fifteenth 17.7 sixteenth 20.7 reverse 3.2, 3.7, 5.0, 5.8, 7.3, 8.6, 8.7, 10.2 **Clutch** single dry disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 194.4" left 194.4"**Turning space diameter** (on concrete surface without brake) right 432.2" left 432.2"**Power take-off** 1000 rpm at 2070 engine rpm and 540 rpm at 2105 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 165°F. Nine gears were chosen between 15% slip and 10 mph. The pull in 2nd (1LoDD) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1319.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
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Board of Tractor Test Engineers

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NEBRASKA TRACTOR TEST 1320—INTERNATIONAL 3588 DIESEL 16-SPEED

POWER TAKF OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1159 rpm)								
150.41	2400	9.590	0.446	15.68	189	64	75	28.820
Standard Power Take-off Speed (1000 rpm)—One Hour								
152.07	2071	8.957	0.412	16.98	191	64	75	28.820
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
131.35	2468	8.786	0.468	14.95	187	65	75	......
0.00	2650	3.279	......	......	180	65	75	......
68.44	2566	6.090	0.623	11.24	183	65	75	......
150.53	2400	9.566	0.445	15.74	192	66	76	......
34.81	2611	4.731	0.951	7.36	182	66	76	......
100.88	2522	7.423	0.515	13.59	186	66	76	.....
Av 81.00	2536	6.646	0.574	12.19	185	66	75	28.817

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (4LoDD) Gear											
126.15	7777	6.08	2402	2.50	9.607	0.533	13.13	190	67	72	28.915
75% of Pull at Maximum Power—Ten Hours 8th (4LoDD) Gear											
101.71	5994	6.36	2495	1.83	8.339	0.574	12.20	189	76	82	28.606
50% of Pull at Maximum Power—Two Hours 8th (4LoDD) Gear											
69.91	4012	6.53	2547	1.10	6.786	0.679	10.30	185	72	76	28.900
50% of Pull at Reduced Engine Speed—Two Hours 11th (2HiTA) Gear											
70.05	4011	6.55	1492	1.10	5.089	0.509	13.76	186	72	76	28.845
MAXIMUM POWER IN SELECTED GEARS											
99.32	17589	2.12	2499	10.60	2nd (1LoDD) Gear			185	67	68	28.750
123.86	16603	2.80	2401	8.38	3rd (2LoTA) Gear			189	63	66	28.940
126.74	14079	3.38	2400	5.49	4th (2LoDD) Gear			189	63	65	28.940
127.67	11074	4.32	2399	3.65	5th (3LoTA) Gear			189	63	65	28.940
127.26	9362	5.10	2400	3.00	6th (3LoDD) Gear			189	62	64	28.940
127.33	9226	5.18	2402	2.83	7th (4LoTA) Gar			188	62	64	28.940
129.46	7981	6.08	2401	2.41	8th (4LoDD) Gear			189	66	71	28.920
130.94	7387	6.65	2401	2.33	9th (1HiTA) Gear			189	64	67	28.940
130.07	6249	7.81	2401	1.91	10th (1HiDD) Gear			189	64	68	28.940

LUGGING ABILITY IN RATED GEAR (8th 4LoDD)						
Crankshaft Speed rpm	2401	2163	1921	1677	1438	1200
Pounds Pull	7981	9225	9727	10367	9675	8702
Increase in Pull %	0	16	22	30	21	9
Horsepower	129.46	134.12	125.34	116.28	93.29	70.28
Miles Per Hour	6.08	5.45	4.83	4.21	3.62	3.03
Slip of Drivers %	2.41	2.75	3.24	3.57	3.08	2.75

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	78.5
75% of Pull at Max. Power 10 Hours	79.0
50% of Pull at Max. Power 2 Hours	78.5
50% of Pull at Reduced Engine Speed 2 Hours	76.0
Bystander in 15th (4HiTA) gear	88.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 18.4R38; 8; 16	Two 18.4R38; 8; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	572 lb	None
Front Tires	—No., size, ply & psi	Two 18.4R38; 8; 16	Two 18.4R38; 8; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	62 lb	None
Height of drawbar		20 in	20 in
Static weight with operator—rear		9080 lb	7935 lb
	front	9810 lb	9685 lb
	Total	18890 lb	17620 lb

Department of Agricultural Engineering

Dates of Test: August 22 to 29, 1979

Manufacturer: International Harvester Company, 401 North Michigan Avenue, Chicago, IL 60611

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8407 **Fuel weight** 7.000 lbs/gal **Oil SAE** 30 **API service classification** SC/SE-CA/CD **To motor** 3.938 gal **Drained from motor** 3.731 gal **Transmission and final drive lubricant** I.H. HyTran Fluid **Total time engine was operated** 36.5 hours.

ENGINE **Make** International Diesel **Type** 6 cylinder vertical with turbocharger **Serial No.** 467TT2U090407* **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 4.300" x 5.350" **Compression ratio** 16.3 to 1 **Displacement** 466 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** four wheel drive **Serial No.** 2890007U9649* **Tread width** rear 59.8" to 104" front 59.8" to 104" **Wheel base** 110" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 60.8" Vertical distance above roadway 41.5" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph** first 1.8 second 2.2 third 2.9 fourth 3.4 fifth 4.3 sixth 5.0 seventh 5.1 eighth 5.9 ninth 6.5 tenth 7.6 eleventh 10.1 twelfth 11.9 thirteenth 14.9 fourteenth 17.4 fifteenth 17.7 sixteenth 20.7 reverse 3.2, 3.7, 5.0, 5.8, 7.3, 8.6, 8.7, 10.2 **Clutch** single dry disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 194.4" left 194.4" **Turning space diameter** (on concrete surface without brake) right 433.2" left 432.2" **Power take-off** 1000 rpm at 2071 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 164°F. Nine gears were chosen between 15% slip and 10 mph. The pull in 2nd (1LoDD) gear was limited to avoid tractor bouncing.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1320.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1321—MASSEY-FERGUSON 2675 DIESEL 8-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1196 rpm)								
100.84	2500	7.374	0.512	13.68	197	71	75	28.840
Standard Power Take-off Speed (1000 rpm)—One Hour								
95.00	2091	6.331	0.467	15.00	199	69	75	28.875
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
90.37	2636	6.613	0.512	13.67	193	68	75	......
0.00	2751	2.546	......	......	181	68	75	......
46.45	2700	4.440	0.669	10.46	185	68	75	......
102.23	2500	7.431	0.509	13.76	196	68	75	......
23.27	2724	3.300	0.993	7.05	184	68	75	......
68.69	2668	5.383	0.549	12.76	188	68	75	......
Av 55.17	**2663**	**4.952**	**0.628**	**11.14**	**188**	**68**	**75**	**28.910**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 4th Gear											
82.65	6127	5.06	2501	8.06	7.196	0.609	11.48	208	68	85	28.960
75% of Pull at Maximum Power—Ten Hours 4th Gear											
69.69	4745	5.51	2656	5.74	6.021	0.605	11.57	190	61	72	29.070
50% of Pull at Maximum Power—Two Hours 4th Gear											
49.15	3241	5.69	2694	4.02	4.911	0.699	10.01	185	63	71	28.980
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
48.41	3198	5.68	1679	4.06	3.482	0.503	13.90	187	66	78	28.995
MAXIMUM POWER IN SELECTED GEARS											
65.01	10226	2.38	2648	14.81	2nd Gear			186	61	66	28.980
83.34	9244	3.38	2501	12.58	3rd Gear			193	61	66	28.980
85.44	6328	5.06	2499	7.81	4th Gear			204	67	79	28.990
86.18	5466	5.91	2498	6.96	5th Gear			204	68	83	28.980
85.02	3825	8.39	2500	4.67	6th Gear			201	68	83	28.970

LUGGING ABILITY IN RATED GEAR (4th)

Crankshaft Speed rpm	2499	2250	1996	1751	1490	1245
Pounds Pull	6328	6792	7238	7591	7589	7445
Increase in Pull %	0	7	14	20	20	18
Horsepower	85.44	81.95	76.87	70.17	59.65	48.95
Miles Per Hour	5.06	4.52	3.98	3.47	2.95	2.47
Slip of Drivers %	7.81	8.58	9.41	9.82	10.22	9.95

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	79.0
75% of Pull at Max. Power 10 Hours	82.0
50% of Pull at Max. Power 2 Hours	82.5
50% of Pull at Reduced Engine Speed 2 Hours	79.0
Bystander in 8th gear	90.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 18.4-38; 10; 22	Two 18.4-38; 10; 22
Ballast	—Liquid (each)	965 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 6; 32	Two 11.00-16; 6; 32
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Height of drawbar		21.5 in	21.5 in
Static weight with operator—rear		10500 lb	8570 lb
	front	3780 lb	3780 lb
	Total	14280 lb	12350 lb

Department of Agricultural Engineering

Dates of Test: August 31 to September 8, 1979

Manufacturer: Massey-Ferguson Inc., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8407 **Fuel weight** 7.000 lbs/gal **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 4.195 gal **Drained from motor** 3.716 gal **Transmission and final drive lubricant** MF Permatran **Total time engine was operated** 31.5 hours.

ENGINE Make Perkins Diesel **Type** six cylinder vertical **Serial No.** TW31008N28496F **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.875" x 5.0" **Compression ratio** 16.0 to 1 **Displacement** 354 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type standard **Serial No.** 9R 002625 **Tread width** rear 65" to 95" front 60" to 80" **Wheel base** 105.4" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 34.4" Vertical distance above roadway 43.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.9 second 2.6 third 3.8 fourth 5.4 fifth 6.3 sixth 8.7 seventh 12.7 eighth 18.0 reverse 1.6, 2.2, 3.2, 4.6, 5.4, 7.4 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 135" left 135" (on concrete surface without brake) right 180" left 180" **Turning space diameter** (on concrete surface with brake applied) right 294" left 294" (on concrete surface without brake) right 381" left 381" **Power take-off** 1000 rpm at 2091 engine rpm and 540 rpm at 1992 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 147°F. Five gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1321.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1322—MASSEY-FERGUSON 2705 DIESEL 8-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1196 rpm)								
121.11	2500	7.969	0.461	15.20	189	68	75	28.843
Standard Power Take-off Speed (1000 rpm)—One Hour								
114.44	2091	6.797	0.416	16.84	190	68	75	28.845
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
110.84	2689	8.019	0.506	13.82	189	68	75	......
0.00	2815	3.176	......	......	181	68	75	......
56.80	2756	5.623	0.693	10.10	185	68	76	......
121.88	2500	7.963	0.457	15.31	190	69	75	......
28.54	2786	4.329	1.062	6.59	182	69	75	......
84.07	2724	6.720	0.560	12.51	186	70	77	......
Av 67.02	2712	5.971	0.624	11.22	186	69	75	28.847

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours Gear											
98.51	6979	5.29	2500	7.14	7.857	0.558	12.54	193	83	89	28.815
75% of Pull at Maximum Power—Ten Hours 4th Gear											
83.29	5366	5.82	2695	5.23	7.371	0.619	11.30	189	75	89	28.771
50% of Pull at Maximum Power—Two Hours 4th Gear											
58.19	3620	6.03	2740	3.63	6.161	0.741	9.45	188	82	91	28.770
50% of Pull at Reduced Engine Speed—Two Hours 6th Gear											
58.30	3632	6.02	1714	3.79	4.304	0.517	13.55	184	68	69	28.970
MAXIMUM POWER IN SELECTED GEARS											
84.07	12588	2.50	2691	14.89	2nd Gear			187	70	74	28.800
97.98	10366	3.54	2499	11.71	3rd Gear			192	74	83	28.830
101.05	7155	5.30	2499	7.03	4th Gear			191	72	79	28.840
101.47	6162	6.17	2500	6.20	5th Gear			192	74	83	28.820
98.41	4229	8.73	2499	4.34	6th Gear			191	75	85	28.820

LUGGING ABILITY IN RATED GEAR (4th)

Crankshaft Speed rpm	2499	2253	1996	1744	1492	1247
Pounds Pull	7155	7760	8541	8813	8820	8496
Increase in Pull %	0	8	19	23	23	19
Horsepower	101.05	98.17	94.80	85.16	72.83	58.82
Miles Per Hour	5.30	4.74	4.16	3.62	3.10	2.60
Slip of Drivers %	7.03	7.62	8.50	8.93	9.07	8.64

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	80.5
75% of Pull at Max. Power 10 Hours	80.0
50% of Pull at Max. Power 2 Hours	80.0
50% of Pull at Reduced Engine Speed 2 Hours	79.0
Bystander in 7th gear	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 20.8-38; 10; 32	Two 20.8-38; 10; 22
Ballast	—Liquid (each)	1148 lb	None
	Cast Iron (each)	1000 lb	None
Front Tires	—No., size, ply & psi	Two 11.00-16; 6; 32	Two 11.00-16; 6; 32
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Height of drawbar		22.5 in	22.5 in
Static weight with operator	—rear	12970 lb	8675 lb
	front	3830 lb	3830 lb
	Total	16800 lb	12505 lb

Department of Agricultural Engineering

Dates of Test: August 31 to September 6, 1979

Manufacturer: Massey-Ferguson, Inc., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8407 **Fuel weight** 7.000 lbs/gal **Oil** SAE 20-20W **API service classification** SB/SE-CA/CD **To motor** 4.199 gal **Drained from motor** 3.565 gal **Transmission and final drive lubricant** MF Permatran **Total time engine was operated** 33.0 hours.

ENGINE **Make** Perkins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** TU31010N29596F **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.875" x 5.0" **Compression ratio** 16.0 to 1 **Displacement** 354 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: **Type** standard **Serial No.** 9R 004209 **Tread width** rear 65" to 95" front 60" to 80" **Wheel base** 105.4" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 34.2" Vertical distance above roadway 43.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 2.0 second 2.7 third 3.9 fourth 5.6 fifth 6.5 sixth 9.0 seventh 13.1 eighth 18.7 reverse 1.7, 2.3, 3.3, 4.8, 5.5, 7.7 **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 135" left 135" (on concrete surface without brake) right 180" left 180" **Turning space diameter** (on concrete surface with brake applied) right 294" left 294" (on concrete surface without brake) right 381" left 381" **Power take-off** 1000 rpm at 2091 engine rpm and 540 rpm at 1992 engine rpm.

REPAIRS AND ADJUSTMENTS: The tube in the left rear tire was replaced at end of the 50% Drawbar Fuel Test.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 151°F. Five gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1322.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1323—JOHN DEERE 8440 DIESEL 16-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—993 rpm)								
179.83	2100	11.340	0.443	15.86	169	66	75	28.887
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
157.13	2158	10.390	0.464	15.12	167	67	75	......
0.00	2311	3.462	......	......	154	66	73	......
81.17	2234	6.975	0.603	11.64	160	66	74	......
180.04	2101	11.343	0.442	15.87	171	67	75	......
41.43	2272	5.355	0.907	7.74	156	66	74	......
119.98	2196	8.655	0.506	13.86	164	66	74	......
Av 96.62	2212	7.697	0.559	12.55	162	66	74	28.910

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 6th (C-1) Gear											
160.58	10051	5.99	2100	3.04	11.237	0.491	14.29	157	66		29.030
75% of Pull at Maximum Power—Ten Hours 6th (C-1) Gear											
127.31	7601	6.28	2185	2.35	9.745	0.537	13.06	156	60		29.176
50% of Pull at Maximum Power—Two Hour 6th (C-1) Gear											
86.98	5070	6.43	2220	1.61	7.729	0.624	11.25	145	54	68	29.010
50% of Pull at Reduced Engine Speed—Two Hours 9th (B-3) Gear											
86.60	5048	6.43	1469	1.61	6.215	0.504	13.93	149	54	68	29.000
MAXIMUM POWER IN SELECTED GEARS											
138.33	25383	2.04	2146	14.65	1st (A-1) Gear			159	45	48	29.140
150.68	21080	2.68	2102	8.59	2nd (A-2) Gear			155	53	62	29.040
160.17	14892	4.03	2100	4.67	3rd (A-3) Gear			153	52	58	29.040
163.26	12314	4.97	2098	3.78	4th (B-1) Gear			153	51	57	29.030
156.14	11486	5.10	2100	3.62	5th (A-4) Gear			152	51	56	29.030
161.90	10131	5.99	2100	2.96	6th (C-1) Gear			149	50	53	29.020
159.31	9535	6.27	2100	2.87	7th (B-2) Gear			153	52	59	29.040
159.42	7938	7.53	2100	2.29	8th (C-2) Gear			154	52	60	29.040
159.09	6513	9.16	2099	1.95	9th (B-3) Gear			153	53	61	29.040

LUGGING ABILITY IN RATED GEAR (6th C-1)

Crankshaft Speed rpm	2100	1882	1683	1472	1256	1046
Pounds Pull	10131	11505	12125	12990	13651	12077
Increase in Pull %	0	14	20	28	35	19
Horsepower	161.90	164.02	154.31	144.18	128.82	95.48
Miles Per Hour	5.99	5.35	4.77	4.16	3.54	2.96
Slip of Drivers %	2.96	3.45	3.62	3.94	4.27	3.78

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	79.0
75% of Pull at Max. Power 10 Hours	79.0
50% of Pull at Max. Power 2 Hours	78.0
50% of Pull at Reduced Engine Speed 2 Hours	76.0
Bystander in 15th (D-3) gear	88.0

TIRES, BALLAST AND WEIGHT		Without Ballast
Rear Tires	—No., size, ply & psi	Four 20.8-38; 8; 12
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Front Tires	—No., size, ply & psi	Four 20.8-38; 8; 12
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Height of drawbar		16.5 in.
Static weight with operator	—rear	12770 lb
	front	23820 lb
	total	26590 lb

Department of Agricultural Engineering

Dates of Test: September 10-15, 1979

Manufacturer: John Deere Waterloo Tractor Works,
P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8430 **Fuel weight** 7.019 lbs/gal **Oil** SAE 30 API **service classification** SD-CC/CD **To motor** 4.802 gal **Drained from motor** 4.352 gal **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 34.0 hours.

ENGINE Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 6466AR-01083158RG **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 4.5625" x 4.75" **Compression ratio** 15.5 to 1 **Displacement** 466 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type Four wheel drive with duals **Serial No.** 8440H-001637R **Tread width** rear 63" to 130" front 63" to 130" **Wheel base** 125" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 65.0" Vertical distance above roadway 40.5" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph** first 2.2 second 2.8 third 3.9 fourth 4.9 fifth 5.1 sixth 5.7 seventh 6.3 eighth 7.4 ninth 8.8 tenth 9.3 eleventh 10.3 twelfth 11.4 thirteenth 12.0 fourteenth 13.4 fifteenth 16.7 sixteenth 21.7 reverse 4.1, 5.3, 9.2, 10.7, 11.9, 14.0 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** single wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 248" left 248" **Turning space diameter** (on concrete surface without brake) right 516" left 516" **Power take-off** 993 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 153°F. Nine gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1323.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1324—JOHN DEERE 8640 DIESEL 16-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—993 rpm)								
228.75	2100	14.657	0.450	15.61	189	59	75	29.053
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
199.53	2156	13.421	0.472	14.87	187	59	75	......
0.00	2290	4.424	......	......	176	59	75	......
102.85	2224	9.027	0.616	11.39	181	59	76	......
232.88	2100	14.840	0.447	15.69	190	59	75	......
52.56	2255	6.727	0.904	7.77	178	58	75	......
152.19	2192	11.211	0.517	13.58	184	58	76	......
Av 123.29	**2203**	**9.942**	**0.566**	**12.40**	**183**	**59**	**75**	**29.033**

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 6th (C-1) Gear											
203.34	13670	5.58	2099	3.35	14.461	0.499	14.06	187	58	77	29.100
75% of Pull at Maximum Power—Ten Hours 6th (C-1) Gear											
163.04	10515	5.81	2168	2.40	12.406	0.534	13.14	184	59	77	28.966
50% of Pull at Maximum Power—Two Hours 6th (C-1) Gear											
111.08	6990	5.96	2207	1.71	9.955	0.629	11.16	181	56	66	29.100
50% of Pull at Reduced Engine Speed—Two Hours 9th (B-3) Gear											
111.48	7002	5.97	1462	1.63	7.943	0.500	14.04	182	59	76	29.125
MAXIMUM POWER IN SELECTED GEARS											
175.50	27782	2.37	2140	14.82	2nd (A-2) Gear			183	53	59	29.090
201.17	20191	3.74	2100	5.29	3rd (A-3) Gear			186	57	72	29.120
208.38	16887	4.63	2100	4.11	4th (B-1) Gear			186	55	67	29.120
200.31	15836	4.74	2100	3.79	5th (A-4) Gear			186	55	66	29.120
208.21	13998	5.58	2099	3.15	6th (C-1) Gear			186	54	64	29.130
205.39	13190	5.84	2100	2.99	7th (B-2) Gear			187	56	68	29.120
205.21	10960	7.02	2100	2.42	8th (C-2) Gear			186	56	69	29.120
205.03	9002	8.54	2098	2.09	9th (B-3) Gear			186	57	70	29.120

LUGGING ABILITY IN RATED GEAR (6th C-1)						
Crankshaft Speed rpm	2099	1885	1676	1471	1259	1044
Pounds Pull	13998	16311	17660	17296	17233	15116
Increase in Pull %	0	17	26	28	23	8
Horsepower	208.21	216.51	207.56	184.69	152.27	111.37
Miles Per Hour	5.58	4.98	4.41	3.86	3.31	2.76
Slip of Drivers %	3.15	3.71	4.19	4.51	4.19	3.71

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	81.0
75% of Pull at Max. Power 10 Hours	80.0
50% of Pull at Max. Power 2 Hours	80.5
50% of Pull at Reduced Engine Speed 2 Hours	76.0
Bystander in 15th (D-3) gear	90.0

TIRES, BALLAST AND WEIGHT		**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 23.1-34; 8; 12
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Front Tires	—No., size, ply & psi	Four 23.1-34; 8; 12
Ballast	—Liquid (each)	None
	—Cast Iron (each)	None
Height of drawbar	16 in	
Static weight with operator—rear		13610 lb
front		14660 lb
total		28270 lb

Department of Agricultural Engineering

Dates of Test: September 11-18, 1979

Manufacturer: John Deere Waterloo Tractor Works,
P.O. Box 270, Waterloo, Iowa 50704

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8430 **Fuel weight** 7.019 lbs/gal **Oil** SAE 30 **API service classification** SD-CC/CD **To motor** 5.581 gal **Drained from motor** 5.043 gal **Transmission and final drive lubricant** John Deere Hy-Gard **Total time engine was operated** 33.0 hours.

ENGINE Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 6619AR-08 032071RG **Crankshaft** lengthwise **Rated rpm** 2100 **Bore and stroke** 5.125" x 5.00" **Compression ratio** 15.2 to 1 **Displacement** 619 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Muffler** vertical **Cooling medium temperature control** three thermostats.

CHASSIS: Type Four wheel drive with duals **Serial No.** 8640H-002277R **Tread width** rear 63" to 130" front 63" to 130" **Wheel base** 125" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 65.2" Vertical distance above roadway 40.6" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph** first 2.1 second 2.6 third 3.8 fourth 4.6 fifth 4.7 sixth 5.5 seventh 5.8 eighth 6.9 ninth 8.4 tenth 9.0 eleventh 10.0 twelfth 10.4 thirteenth 11.2 fourteenth 12.5 fifteenth 16.2 sixteenth 20.2 reverse 4.1, 5.1, 9.1, 10.8, 11.3, 13.5 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** single wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 240" left 240" **Turning space diameter** (on concrete surface without brake) right 504" left 504"**Power take-off** 993 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 157°F. Eight gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1324.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1325—FORD 1700 DIESEL
12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—551 rpm)								
23.26	2500	1.780	0.537	13.07	216	61	75	29.167
Standard Power Take-off Speed (540 rpm)—One Hour								
23.02	2452	1.768	0.539	13.02	217	61	75	29.180
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
20.36	2576	1.475	0.508	13.80	202	62	75	.....
0.00	2698	0.521	.....	.....	170	63	75	.....
10.46	2642	0.966	0.648	10.83	176	63	75	.....
23.00	2500	1.791	0.546	12.84	212	63	75	.....
5.27	2668	0.731	0.974	7.21	174	64	76	.....
15.49	2610	1.171	0.531	13.22	184	64	78	.....
Av 12.43	2616	1.109	0.626	11.21	186	63	76	29.187

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (3-2) Gear											
18.82	16.46	4.29	2499	8.19	1.727	0.644	10.89	213	61	80	29.035
75% of Pull at Maximum Power—Ten Hours 8th (3-2) Gear											
15.62	1296	4.52	2578	6.22	1.361	0.612	11.48	193	65	81	28.758
50% of Pull at Maximum Power—Two Hours 8th (3-2) Gear											
10.76	862	4.68	2619	4.37	1.033	0.674	10.41	181	64	85	28.970
50% of Pull at Reduced Engine Speed—Two Hours 10th (4-1) Gear											
10.80	865	4.68	1714	4.15	0.855	0.556	12.63	191	66	85	28.910
MAXIMUM POWER IN SELECTED GEARS											
17.52	2801	2.35	2558	14.89	6th (2-3) Gear			177	54	56	28.810
19.21	2317	3.11	2501	11.83	7th (3-1) Gear			208	56	72	29.060
19.72	1726	4.29	2498	8.26	8th (3-2) Gear			199	54	65	29.060
20.21	1368	5.54	2501	6.43	9th (3-3) Gear			207	56	73	29.050
20.10	1118	6.74	2499	5.31	10th (4-1) Gear			206	56	75	29.050
19.30	797	9.08	2497	3.81	11th (4-2) Gear			203	58	76	29.050

LUGGING ABILITY IN RATED GEAR (8th 3-2)

Crankshaft Speed rpm	2498	2254	1997	1750	1494	1251
Pounds Pull	1726	1791	1872	1830	1794	1722
Increase in Pull %	0	4	8	6	4	0
Horsepower	19.72	18.39	16.96	14.57	12.21	9.86
Miles Per Hour	4.29	3.85	3.40	2.99	2.55	2.15
Slip of Drivers %	8.26	8.62	8.97	8.70	8.53	8.17

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	95.5
75% of Pull at Max. Power 10 Hours	93.5
50% of Pull at Max. Power 2 Hours	93.0
50% of Pull at Reduced Engine Speed 2 Hours	87.5
Bystander in 12th (4-3) gear	81.5

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 11.2-24; 4; 14	Two 11.2-24; 4; 14
Ballast	—Liquid (each)	265 lb	None
	Cast Iron (each)	130 lb	None
Front Tires	—No., size, ply & psi	Two 5.00-15; 4; 40	Two 5.00-15; 4; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	160 lb	None
Height of drawbar		15.5 in	15.5 in
Static weight with operator—rear		2495 lb	1705 lb
	front	1230 lb	910 lb
	Total	3725 lb	2615 lb

Department of Agricultural Engineering

Dates of Test: September 24-28, 1979

Manufacturer: Ishikawajima-Shibaura Machinery Co., Ltd., Tokyo, Japan

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8430 **Fuel weight** 7.019 lbs/gal **Oil** SAE 30 API service classification SB/SE-CA/CD **To motor** 1.179 gal **Drained from motor** 1.028 gal **Transmission and final drive lubricant** Ford M2C 134A fluid **Total time engine was operated** 33.5 hours.

ENGINE Make Shibaura Diesel **Type** two cylinder vertical **Serial No.** LE 892-36329 **Crankshaft** lengthwise **Rated rpm** 2500 **Bore and stroke** 3.54" x 3.94" **Compression ratio** 21 to 1 **Displacement** 77.6 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** oil bath steel wool **Oil filter** one paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** Standard **Serial No.** U-701696 **Tread width** rear 43.3" to 58.7" front 43.5" to 57.5" **Wheel base** 60.2" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 23.4" Vertical distance above roadway 28.9" Horizontal distance from center of rear wheel tread 0.1" to the right **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 0.7 second 0.9 third 1.2 fourth 1.6 fifth 2.2 sixth 2.8 seventh 3.6 eighth 4.8 ninth 6.1 tenth 7.3 eleventh 9.7 twelfth 12.3 reverse 0.8, 1.9, 4.2, 8.6 **Clutch** single dry disc operated by foot pedal **Brakes** expanding shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 90.6" left 90.6" (on concrete surface without brake) right 98.4" left 98.4" **Turning space diameter** (on concrete surface with brake applied) right 189" left 189" (on concrete surface without brake) right 204.8" left 204.8" **Power take-off** 540 rpm at 2452 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 165°F. Six gears were chosen between 15% slip and 10 mph. During the final inspection both cylinder walls were found to be scratched.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1325.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1326—FORD 1900 DIESEL 12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—616 rpm)								
26.88	2800	2.162	0.565	12.43	218	59	75	29.100
Standard Power Take-off Speed (540 rpm)—One Hour								
25.68	2452	2.042	0.558	12.58	223	58	75	29.090
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
23.65	2898	1.868	0.554	12.66	206	58	74	......
0.00	2960	0.684	......	......	171	59	75	......
11.96	2932	1.197	0.702	10.00	176	59	76	......
27.21	2798	2.184	0.563	12.46	214	59	75	......
6.00	2944	0.919	1.074	6.53	174	60	76	......
17.88	2921	1.504	0.591	11.88	188	60	77	......
Av 14.45	2909	1.393	0.676	10.38	188	59	76	29.083

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (3-2) Gear											
22.06	1703	4.86	2800	7.26	2.119	0.674	10.41	207	61	75	28.850
75% of Pull at Maximum Power—Ten Hours 8th (3-2) Gear											
18.27	1336	5.13	2890	5.19	1.678	0.645	10.89	190	62	78	28.901
50% of Pull at Maximum Power—Two Hours 8th (3-2) Gear											
12.29	880	5.24	2910	3.79	1.318	0.753	9.32	177	63	79	28.825
50% of Pull at Reduced Engine Speed—Two Hours 10th (4-1) Gear											
12.20	873	5.24	1969	3.63	1.069	0.615	11.41	178	62	78	28.840
MAXIMUM POWER IN SELECTED GEARS											
20.33	2964	2.57	2866	14.87	6th (2-3) Gear			184	52	64	28.920
22.35	2432	3.45	2801	10.88	7th (3-1) Gear			200	60	70	28.840
23.00	1773	4.86	2800	7.21	8th (3-2) Gear			196	58	66	28.820
23.49	1421	6.20	2800	5.59	9th (3-3) Gear			200	60	70	28.840
23.47	1194	7.37	2800	4.53	10th (4-1) Gear			200	60	71	28.840

LUGGING ABILITY IN RATED GEAR (8th 3-2)

Crankshaft Speed rpm	2800	2518	2248	1948	1681	1395
Pounds Pull	1773	1939	2014	2012	2009	2000
Increase in Pull %	0	9	14	13	13	13
Horsepower	23.00	22.42	20.68	17.90	15.43	12.76
Miles Per Hour	4.86	4.34	3.85	3.34	2.88	2.39
Slip of Drivers %	7.21	8.03	8.40	8.50	8.40	8.31

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	94.5
75% of Pull at Max. Power 10 Hours	92.5
50% of Pull at Max. Power 2 Hours	92.5
50% of Pull at Reduced Engine Speed 2 Hours	87.5
Bystander in 12th (4-3) gear	82.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Two 12.4-24; 4; 14	Two 12.4-24; 4; 14
Ballast	—Liquid (each)	323 lb	None
	Cast Iron (each)	130 lb	None
Front Tires	—No., size, ply & psi	Two 5.00-15; 4; 40	Two 5.00-15; 4; 40
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	160 lb	None
Height of drawbar		17 in	17 in
Static weight with operator—rear		2680 lb	1775 lb
	front	1480 lb	1160 lb
	Total	4160 lb	2935 lb

Department of Agricultural Engineering

Dates of Test: September 24 to October 1, 1979

Manufacturer: Ishikawajima-Shibaura Machinery Company, Ltd., Tokyo, Japan

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8430 **Fuel weight** 7.019 lbs/gal **Oil** SAE 30 API **service classification** SC/SE-CA/CD **To motor** 1.782 gal **Drained from motor** 1.620 gal **Transmission and final drive lubricant** Ford M2C134A fluid **Total time engine was operated** 33.0 hours.

ENGINE **Make** Shibaura Diesel **Type** three cylinder vertical **Serial No.** LEM853-15539 **Crankshaft** lengthwise **Rated rpm** 2800 **Bore and stroke** 3.35" x 3.31" **Compression ratio** 21 to 1 **Displacement** 87.2 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** oil bath steel wool **Oil filter** one paper cartridge **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** Standard **Serial No.** U-901206 **Tread width** rear 45.7" to 61.0" front 43.5" to 57.5" **Wheel base** 63.0" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 27.1" Vertical distance above roadway 27.9" Horizontal distance from center of rear wheel tread 0.2" to the right **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 0.8 second 1.0 third 1.3 fourth 1.8 fifth 2.4 sixth 3.0 seventh 4.0 eighth 5.4 ninth 6.7 tenth 7.9 eleventh 10.7 twelfth 13.4 reverse 0.9, 2.1, 4.6, 9.2 **Clutch** single dry disc operated by foot pedal **Brakes** expanding shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 94.5" left 94.5" (on concrete surface without brake) right 102.4" left 102.4" **Turning space diameter** (on concrete surface with brake applied) right 196.8" left 196.8" (on concrete surface without brake) right 220.4" left 220.4" **Power take-off** 540 rpm at 2452 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 181°F. Five gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1326.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1327—JOHN DEERE 1050 DIESEL 8-SPEED

POWER TAKE-OFF PERFORMANCE

	Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer Inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION									
Rated Engine Speed—Two Hours (PTO Speed—574 rpm)									
	33.41	2400	2.206	0.464	15.14	211	52	75	29.203
Standard Power Take-off Speed (540 rpm)—One Hour									
	33.42	2258	2.161	0.454	15.46	216	52	75	29.180
VARYING POWER AND FUEL CONSUMPTION—Two Hours									
	29.43	2488	2.005	0.478	14.68	205	52	76	......
	0.00	2584	0.645	......	......	166	52	76	......
	15.0	2550	1.282	0.597	11.77	177	52	76	......
	33.2	2400	2.223	0.469	14.98	211	52	76	......
	7.0	2569	0.936	0.865	8.12	169	52	75	......
	22.3	2516	1.628	0.512	13.72	188	52	75	......
Av	17.9	2518	1.453	0.568	12.36	186	53	75	29.167

DRAWBAR PERFORMANCE

(Front Wheel Drive Disengaged)

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Air wet bulb	Air dry bulb	Barometer Inches of Mercury
Maximum Available Power—Two Hours 6th Gear											
27.25	1938	5.27	2398	6.40	2.208	0.569	12.34	208	51	68	28.565
75% of Pull at Maximum Power—Ten Hours 6th Gear											
22.46	1498	5.62	2504	4.51	1.873	0.586	11.99	107	57	71	28.568
50% of Pull at Maximum Power—Two Hours 6th Gear											
15.33	997	5.77	2538	3.27	1.514	0.693	10.13	169	45	52	28.820
50% of Pull at Reduced Engine Speed—Two Hours 7th Gear											
15.39	999	5.78	1717	3.48	1.247	0.569	12.35	169	43	51	28.870
MAXIMUM POWER IN SELECTED GEARS											
21.50	3466	2.33	2506	14.96	4th Gear			173	43	49	28.790
27.40	2906	3.54	2400	10.56	5th Gear			205	49	64	28.630
28.15	2002	5.27	2401	6.51	6th Gear			205	47	61	28.690
27.76	1302	7.99	2401	4.14	7th Gear			205	49	65	28.600

LUGGING ABILITY IN RATED GEAR (6th)

Crankshaft Speed rpm	2401	2154	1919	1678	1428	1200
Pounds Pull	2002	2296	2487	2510	2384	2215
Increase in Pull %	0	15	24	25	19	11
Horsepower	28.15	28.60	27.37	24.13	19.60	15.43
Miles Per Hour	52.7	4.67	4.13	3.61	3.08	2.61
Slip of Drivers %	6.51	7.81	8.45	8.66	8.03	7.49

TRACTOR SOUND LEVEL WITHOUT CAB

	dB(A)	(Front Wheel Drive Disengaged) dB(A)
Maximum Available Power 2 Hours	90.0	89.0
75% of Pull at Max. Power 10 Hours	.....	89.5
50% of Pull at Max. Power 2 Hours	.....	89.0
50% of Pull at Reduced Engine Speed 2 Hours	.....	86.5
Bystander in 8th gear	.....	79.5

Department of Agricultural Engineering

Dates of Test: October 8-12, 1979

Manufacturer: Yanmar Diesel Co. Ltd., Osaka, Japan

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8430 **Fuel weight** 7.019 lbs/gal **Oil SAE** 30 **API service classification** SD-CC/CD **To motor** 1.551 gal **Drained from motor** 1.490 gal **Transmission and final drive lubricant** John Deere Hy Gard **Total time engine was operated** 37.0 hours.

ENGINE **Make** Yanmar Diesel **Type** three cylinder vertical with turbocharger **Serial No.** 3T90TJ80156 **Crankshaft** lengthwise **Rated rpm** 2400 **Bore and stroke** 3.54" x 3.54" **Compression ratio** 20.4 to 1 **Displacement** 105 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one paper cartridge **Fuel filter** one paper element **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** Four wheel drive **Serial No.** 1050S-001772 **Tread width** rear 51" to 75" front 49" **Wheel base** 69" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 28.9" Vertical distance above roadway 28.4" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 0.9 second 1.2 third 1.8 fourth 2.7 fifth 4.0 sixth 5.7 seventh 8.5 eighth 12.5 reverse 1.2, 5.7 **Clutch** single dry disc operated by foot pedal **Brakes** internal expanding shoe operated by two foot pedals which can be locked together **Steering** mechanical **Turning radius** (on concrete surface with brake applied) right 100.4" left 100.4" (on concrete surface without brake) right 108.3" left 108.7"**Turning space diameter** (on concrete surface with brake applied) right 207.8" left 207.8" (on concrete surface without brake) right 223.6" left 224.4" **Power take-off** 540 rpm at 2258 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 135°F. Four gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1327.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

continued on next page

NEBRASKA TRACTOR TEST 1327—JOHN DEERE 1050 DIESEL 8-SPEED

continued from previous page

DRAWBAR PERFORMANCE

(Front Wheel Drive Engaged)

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 6th Gear											
27.31	1887	5.43	2401	4.76	2.173	0.558	12.57	208	52	69	28.495
MAXIMUM POWER IN SELECTED GEARS											
25.03	4033	2.33	2475	14.77	4th Gear			184	43	49	28.790
28.49	1973	5.42	2400	4.99	6th Gear			206	49	64	28.660

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 13.6-28; 4; 14	Two 13.6-28; 4; 14
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	315 lb	None
Front Tires	—No., size, ply & psi	Two 7-16; 4; 22	Two 7-16; 4; 22
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	50 lb	None
Height of drawbar		16 in	16 in
Static weight with operator—rear		2680 lb	2050 lb
	front	1460 lb	1360 lb
	Total	4140 lb	3410 lb

NEBRASKA TRACTOR TEST 1328—CASE 4490 DIESEL
12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1000 rpm)								
175.20	2200	11.471	0.460	15.27	196	63	75	28.920
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
154.24	2281	10.552	0.481	14.62	[illegible]	62	74	......
0.00	2397	3.354	......	......	179	62	75	......
79.74	2355	6.857	0.605	11.63	186	62	75	......
176.55	2200	11.516	0.459	15.33	196	62	76	......
40.00	2370	5.069	0.891	7.89	181	60	75	......
117.75	2320	8.640	0.516	13.63	190	60	74	......
Av 94.71	2321	7.665	0.569	12.36	187	61	75	28.967

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (3I) Gear											
150.14	9977	5.64	2199	4.07	11.289	0.529	13.30	195	57	71	28.980
75% of Pull at Maximum Power—Ten Hours 8th (3I) Gear											
121.71	7639	5.97	2298	2.78	9.721	0.562	12.52	190	61	66	28.747
50% of Pull at Maximum Power—Two Hours 8th (3I) Gear											
83.52	5096	6.15	2341	1.82	7.680	0.647	10.87	184	54	57	28.580
50% of Pull at Reduced Engine Speed—Two Hours 9th (3H) Gear											
83.44	5091	6.15	1871	1.74	6.507	0.548	12.82	185	60	65	28.500
MAXIMUM POWER IN SELECTED GEARS											
136.59	21400	2.39	2260	14.83	2nd (1I) Gear			189	48	49	28.600
142.15	19195	2.78	2200	11.34	3rd (2L) Gear			191	56	70	28.990
144.01	17396	3.10	2199	9.28	4th (1H) Gear			192	56	70	28.990
151.05	14548	3.89	2198	6.71	5th (2I) Gear			194	55	67	29.010
151.31	13700	4.14	2200	6.16	6th (3L) Gear			194	55	66	29.020
151.19	11387	4.98	2201	4.51	7th (2H) Gear			193	54	65	29.030
153.30	10180	5.65	2202	4.00	8th (3I) Gear			193	52	62	29.050
152.80	8029	7.14	2200	2.88	9th (3H) Gear			194	55	68	29.000
150.02	5872	9.58	2201	2.05	10th (4L) Gear			194	56	69	29.000

LUGGING ABILITY IN RATED GEAR (8th 3I)

Crankshaft Speed rpm	2202	1976	1765	1544	1310	1101
Pounds Pull	10180	10978	11312	11222	10570	9554
Increase in Pull %	0	8	11	10	4	-6
Horsepower	153.30	147.70	135.63	117.74	94.43	72.13
Miles Per Hour	5.65	5.05	4.50	3.93	3.35	2.83
Slip of Drivers %	4.00	4.51	4.80	4.66	4.22	3.92

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	77.5
75% of Pull at Max. Power 10 Hours	77.5
50% of Pull at Max. Power 2 Hours	77.5
50% of Pull at Reduced Engine Speed 2 Hours	77.5
Bystander in 12th (4H) gear	84.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 18.4-34; 6; 16	Four 18.4-34; 6; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Four 18.4-34; 6; 16	Four 18.4-34; 6; 16
Ballast	—Liquid (each inner)	355 lb	None
	Cast Iron (front end total)	900 lb	None
Height of drawbar		16.5 in	16.5 in
Static weight with operator—rear		9260 lb	9260 lb
	front	13190 lb	11580 lb
	Total	22450 lb	20840 lb

Department of Agricultural Engineering

Dates of Test: October 15-20, 1979

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8444 **Fuel weight** 7.031 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 5.781 gal **Drained from motor** 5.422 gal **Transmission and hydraulic lubricant** Case TFD fluid **Final drive lubricant** Case FDL fluid **Total time engine was operated** 35 hours.

ENGINE **Make** Case Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 10175566 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 15.8 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two disposable cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: **Type** Four-wheel drive with duals **Serial No.** 8854458 **Tread width** rear 74" to 123" front 74" to 123" **Wheel base** 102" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 55.0" Vertical distance above roadway 41.2" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph** first 2.0 second 2.7 third 3.0 fourth 3.3 fifth 4.1 sixth 4.3 seventh 5.1 eighth 5.7 ninth 7.2 tenth 9.5 eleventh 12.7 twelfth 17.5 reverse 3.3, 5.1, 7.2, 17.5 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple dry disc hydraulically operated by foot pedal **Steering** hydrostatic for front wheels, electro hydraulic for rear wheels, front and rear wheels may be steered independently or together **Turning radius** (on concrete surface front-wheel steering) with duals, right 308" left 308" with singles, right 284" left 284" (on concrete surface with four-wheel steering) with duals, right 202" left 202" with singles, right 174" left 174" **Turning space diameter** (on concrete surface with front-wheel steering) with duals, right 640" left 640" with singles, right 597" left 597" (on concrete surface with four-wheel steering) with duals, right 430" left 430" with singles, right 382" left 382" **Power take-off** 1000 rpm at 2200 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 187°F. Nine gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1328.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1329—CASE 4690 DIESEL 12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1000 rpm)								
219.62	2200	14.393	0.461	15.26	204	56	75	28.847
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
192.64	2271	13.078	0.477	14.73	197	56	76	......
0.00	2389	3.682	......	......	176	55	74	......
99.35	2344	8.179	0.579	12.15	186	55	75	......
222.38	2200	14.473	0.458	15.37	200	56	76	......
50.35	2374	5.948	0.831	8.47	182	55	74	......
147.56	2320	10.462	0.499	14.10	190	56	76	......
Av 118.71	**2316**	**9.304**	**0.551**	**12.76**	**188**	**55**	**75**	**29.903**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (3I) Gear											
189.75	11925	5.97	2199	3.98	14.169	0.525	13.39	193	43	53	29.010
75% of Pull at Maximum Power—Ten Hours 8th (3I) Gear											
154.65	9226	6.29	2291	2.87	12.047	0.548	12.84	188	47	55	28.962
50% of Pull at Maximum Power—Two Hours 8th (3I) Gear											
106.98	6195	6.48	2340	1.95	9.547	0.627	11.21	180	44	46	29.030
50% of Pull at Reduced Engine Speed—Two Hours 9th (3H) Gear											
106.97	6192	6.48	1871	1.87	8.331	0.541	13.00	179	30	57	29.025
MAXIMUM POWER IN SELECTED GEARS											
166.25	24564	2.54	2265	14.77	2nd (1I) Gear			176	40	41	29.000
182.35	23207	2.95	2201	10.93	3rd (2L) Gear			187	40	41	29.000
187.55	21323	3.30	2200	8.67	4th (1H) Gear			191	42	50	29.040
192.40	17439	4.14	2199	6.36	5th (2I) Gear			192	41	49	29.050
192.81	16449	4.40	2199	5.62	6th (3L) Gear			192	41	49	29.050
194.96	13883	5.27	2200	4.56	7th (2H) Gear			193	40	48	29.050
195.60	12292	5.97	2200	3.86	8th (3I) Gear			191	40	47	29.060
193.71	9638	7.54	2201	2.99	9th (3H) Gear			192	43	52	29.030

LUGGING ABILITY IN RATED GEAR (3I)

Crankshaft Speed rpm	2200	1983	1759	1538	1316	1093
Pounds Pull	12292	13097	13639	13658	12963	11428
Increase in Pull %	0	7	11	11	5	-7
Horsepower	195.60	187.30	172.60	151.05	123.01	90.61
Miles Per Hour	5.97	5.36	4.75	4.15	3.56	2.97
Slip of Drivers %	3.86	4.17	4.48	4.48	4.17	3.70

TRACTOR SOUND LEVEL WITH CAB	dB(A)
Maximum Available Power 2 Hours	78.0
75% of Pull at Max. Power 10 Hours	78.0
50% of Pull at Max. Power 2 Hours	77.5
50% of Pull at Reduced Engine Speed 2 Hours	76.0
Bystander in 12th (4H) gear	86.0

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 20.8-34; 8; 16	Four 20.8-34; 8; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Four 20.8-34; 8; 16	Four 20.8-34; 8; 16
Ballast	—Liquid (each inner)	1010 lb	None
	Cast Iron (front end total)	900 lb	None
Height of drawbar		18.5 in	18.5 in
Static weight with operator	—rear	9860 lb	9860 lb
	front	15370 lb	12450 lb
	Total	25230 lb	22310 lb

Department of Agricultural Engineering

Dates of Test: October 18-26, 1979

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8444 **Fuel weight** 7.031 lbs/gal **Oil** SAE 30 API service classification SE-CD **To motor** 5.640 gal **Drained from motor** 5.362 gal **Transmission and hydraulic lubricant** Case TFD fluid **Final drive lubricant** Case FDL fluid **Total time engine was operated** 34.5 hours.

ENGINE Make Case Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 10178781 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.625" x 5.0" **Compression ratio** 15.8 to 1 **Displacement** 504 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two paper cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two disposable cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: Type Four-wheel drive with duals **Serial No.** 8854444 **Tread width** rear 76" to 139" front 76" to 139" **Wheel base** 102" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 55.7" Vertical distance above roadway 45.5" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph** first 2.0 second 2.7 third 3.1 fourth 3.4 fifth 4.2 sixth 4.4 seventh 5.2 eighth 5.9 ninth 7.4 tenth 9.9 eleventh 13.3 twelfth 18.2 reverse 3.4, 5.2, 7.4, 18.2 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple dry disc hydraulically operated by foot pedal **Steering** hydrostatic for front wheels, electro hydraulic for rear wheels, front and rear wheels may be steered independently or together **Turning radius** (on concrete surface with front wheel steering) with duals, right 330" left 330" with singles, right 287" left 287" (on concrete surface with four-wheel steering) with duals, right 211" left 211" with singles, right 175" left 175" **Turning space diameter** (on concrete surface with front-wheel steering) with duals, right 689" left 689" with singles, right 603" left 603" (on concrete surface with four-wheel steering) with duals, right 459" left 459" with singles, right 384" left 384" **Power take-off** 1000 rpm at 2200 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 187°F. Eight gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1329.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1330—CASE 4890 DIESEL
12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1000 rpm)								
253.41	2200	15.528	0.431	16.32	180	57	75	28.997
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
225.82	2306	14.516	0.452	15.56	178	57	75	......
0.00	2440	4.698	......	......	168	57	75	......
116.66	2384	9.609	0.579	12.14	172	58	76	......
253.81	2200	15.548	0.431	16.32	181	57	76	......
58.98	2411	7.219	0.861	8.17	171	58	76	......
172.73	2355	12.024	0.489	14.37	175	58	75	......
Av 138.00	**2349**	**10.602**	**0.540**	**13.02**	**174**	**57**	**76**	**28.983**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 8th (3I) Gear											
218.68	13778	5.95	2200	3.87	15.414	0.496	14.19	177	52	62	28.755
75% of Pull at Maximum Power—Ten Hours 8th (3I) Gear											
180.71	10611	6.39	2332	2.66	13.622	0.530	13.27	175	49	61	28.823
50% of Pull at Maximum Power—Two Hours 8th (3I) Gear											
123.55	7061	6.56	2373	1.81	10.880	0.619	11.36	173	57	71	28.680
50% of Pull at Reduced Engine Speed—Two Hours 10th (4L) Gear											
124.06	7088	6.56	1428	1.76	7.983	0.452	15.54	172	58	72	28.645
MAXIMUM POWER IN SELECTED GEARS											
189.97	27627	2.58	2299	14.87	2nd (1I) Gear			174	44	52	28.730
202.31	26801	2.83	2199	13.07	3rd (2L) Gear			175	48	56	28.790
213.38	24137	3.32	2199	8.59	4th (1H) Gear			175	47	54	28.800
222.64	20482	4.08	2200	6.14	5th (2I) Gear			174	46	53	28.800
222.46	19019	4.39	2200	5.55	6th (3L) Gear			174	44	50	28.810
223.22	16133	5.19	2200	4.48	7th (2H) Gear			174	43	49	28.810
224.81	14144	5.96	2201	3.79	8th (3I) Gear			176	42	46	28.840
223.87	11169	7.52	2200	2.85	9th (3H) Gear			174	45	51	28.810

LUGGING ABILITY IN RATED GEAR (8th 3I)						
Crankshaft Speed rpm	2201	1977	1758	1539	1315	1091
Pounds Pull	14144	15239	16248	17301	17939	17723
Increase in Pull %	0	8	15	22	27	25
Horsepower	224.81	216.66	204.57	190.05	167.99	137.74
Miles Per Hour	5.96	5.33	4.72	4.12	3.51	2.91
Slip of Drivers %	3.79	4.18	4.48	4.94	5.25	5.25

TRACTOR SOUND LEVEL WITH CAB	**dB(A)**
Maximum Available Power 2 Hours	77.5
75% of Pull at Max. Power 10 Hours	78.0
50% of Pull at Max. Power 2 Hours	77.0
50% of Pull at Reduced Engine Speed 2 Hours	76.0
Bystander in 12th (4H) gear	88.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 20.8-34; 8; 16	Four 20.8-34; 8; 16
Ballast	—Liquid (each)	None	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Four 20.8-34; 8; 16	Four 20.8-34; 8; 16
Ballast	—Liquid (each inner)	905 lb	None
	Cast Iron (front end total)	900 lb	None
Height of drawbar		18 in	18 in
Static weight with operator	—rear	11640 lb	11640 lb
	front	16820 lb	14110 lb
	Total	28460 lb	25750 lb

Department of Agricultural Engineering

Dates of Test: October 22-29, 1979

Manufacturer: J I Case Company, 700 State Street, Racine, Wisconsin 53404

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8444 **Fuel weight** 7.031 lbs/gal **Oil SAE** 30 **API service classification** SE-CD **To motor** 6.419 gal **Drained from motor** 5.738 gal **Transmission and hydraulic lubricant** Case TFD fluid **Final drive lubricant** Case FDL fluid **Total time engine was operated** 35 hours.

ENGINE **Make** Saab-Scania Dsl **Type** Six cylinder vertical with turbocharger **Serial No.** 5217709 **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 5.00" x 5.71" **Compression ratio** 14.7 to 1 **Displacement** 673 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** full flow centrifugal, separate cartridge for turbocharger oil **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** two disposable cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS: **Type** Four-wheel drive with duals **Serial No.** 8854468 **Tread width** rear 76" to 140" front 76" to 140" **Wheel base** 110" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 59.4" Vertical distance above roadway 40.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (3) range operator controlled powershift **Advertised speeds mph** first 2.0 second 2.7 third 3.1 fourth 3.4 fifth 4.2 sixth 4.4 seventh 5.2 eighth 5.9 ninth 7.4 tenth 9.9 eleventh 13.3 twelfth 18.2 reverse 3.4, 5.2, 7.4, 18.2 **Clutch** multiple dry disc hydraulically operated by foot pedal **Brakes** multiple dry disc hydraulically operated by foot pedal **Steering** hydrostatic for front wheels, electro-hydraulic for rear wheels, front and rear wheels may be steered independently or together **Turning radius** (on concrete surface with front-wheel steering) with duals, right 353" left 353" with singles, 317" left 317" (on concrete surface with four-wheel steering) with duals, right 225" left 225" with singles, right 188" left 188" **Turning space diameter** (on concrete surface with front wheel steering) with duals, right 734" left 734" with singles, right 664" left 664"(on concrete surface with four-wheel steering) with dual right 478" left 478" with singles, right 415" left 415" **Power take-off** 1000 rpm at 2200 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 141°F. Eight gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1330.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1331—VERSATILE 555 DIESEL 15-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption		Hp-hr per gal	Temperature Degrees F			Barometer inches of Mercury
		Gal per hr	Lb per hp-hr		Cooling medium	Air wet bulb	Air dry bulb	
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1068 rpm)								
182.25	2849	11.746	0.455	15.52	181	54	75	28.930
Standard Power Take-off Speed (1000 rpm)—One Hour								
184.35	2667	11.286	0.432	16.33	182	54	75	28.930
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
164.79	3031	11.607	0.497	14.20	180	54	75	......
0.00	3191	5.038	......	......	176	54	74	......
84.87	3126	8.618	0.717	9.85	178	54	75	......
183.43	2850	11.798	0.454	15.55	183	55	76	......
42.83	3156	6.747	1.112	6.35	176	55	74	......
125.89	3086	10.187	0.571	12.36	180	56	76	......
Av 100.30	3073	8.999	0.633	11.15	179	55	75	28.947

DRAWBAR PERFORMANCE AT 2850 RPM

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption		Hp-hr per gal	Temp Degrees F			Barometer inches of Mercury
					Gal per hr	Lb per hp-hr		Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 8th (M-3) Gear											
150.39	10331	5.46	2851	3.37	11.604	0.544	12.96	179	40	51	28.920
75% of Pull at Maximum Power—Ten Hours 8th (M-3) Gear											
125.48	79.36	5.93	3074	2.58	11.239	0.632	11.17	178	40	42	28.943
50% of Pull at Maximum Power—Two Hours 8th (M-3) Gear											
86.05	5297	6.09	3127	1.60	9.743	0.799	8.83	181	33	36	29.100
50% of Pull at Reduced Engine Speed—Two Hours 11th (H-1) Gear											
85.87	5284	6.09	1832	1.64	5.952	0.489	14.43	184	40	47	29.095
MAXIMUM POWER IN SELECTED GEARS											
128.39	23523	2.05	2987	14.98	2nd (L-2) Gear			179	29	32	29.450
143.47	22467	2.39	2849	11.94	3rd (L-3) Gear			180	42	50	28.970
149.43	19758	2.84	2847	7.81	4th (L-4) Gear			180	42	51	28.970
150.66	16420	3.44	2840	5.83	5th (L-5) Gear			179	43	53	28.980
152.51	14519	3.94	2847	4.92	6th (M-1) Gear			179	43	53	28.980
154.20	12685	4.56	2849	4.15	7th (M-2) Gear			178	42	52	29.000
153.91	10579	5.46	2850	3.45	8th (M-3) Gear			179	42	50	29.040
152.64	9233	6.20	2848	2.81	9th (M-4) Gear			178	42	52	29.000
153.25	7762	7.40	2850	2.33	10th (M-5) Gear			179	42	52	28.990
149.21	5907	9.47	2849	1.51	11th (H-1) Gear			179	42	52	28.990

DRAWBAR PERFORMANCE AT 2550 RPM

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption		Hp-hr per gal	Temp Degrees F			Barometer inches of Mercury
					Gal per hr	Lb per hp-hr		Cool-ing med	Air wet bulb	Air dry bulb	
Maximum Available Power—Two Hours 8th (M-3) Gear											
157.09	12124	4.86	2551	3.84	10.753	0.483	14.61	179	44	54	29.130
MAXIMUM POWER IN SELECTED GEARS											
138.86	23883	2.18	2680	14.79	3rd (L-3) Gear			181	32	35	29.380
146.25	22515	2.44	2553	11.67	4th (L-4) Gear			180	42	50	28.970
152.08	18777	3.04	2550	7.09	5th (L-5) Gear			180	42	52	28.970
154.39	16600	3.49	2548	5.91	6th (M-1) Gear			179	43	53	28.980
157.30	14573	4.05	2552	4.85	7th (M-2) Gear			179	42	52	29.000
157.35	12162	4.85	2550	3.84	8th (M-3) Gear			178	42	51	29.020
156.43	10625	5.52	2549	3.21	9th (M-4) Gear			178	42	52	28.990
156.10	8872	6.60	2549	2.73	10th (M-5) Gear			179	42	52	28.990
153.66	68.19	8.45	2549	1.84	11th (H-1) Gear			179	43	53	28.980

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Department of Agricultural Engineering

Dates of Test: October 29 to November 15, 1979

Manufacturer: Versatile Manufacturing Co., 1260 Clarence Avenue, Winnipeg, Manitoba R3T 1T3

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8474 **Fuel weight** 7.056 lbs/gal **Oil** SAE 30 API **service classification** SB/SE-CA/CD **To motor** 6.523 gal **Drained from motor** 6.007 gal **Transmission and hydraulic lubricant** Esso Hydral 56 or equivalent **Final drive lubricant** SAE 90 **Total time engine was operated** 53.0 hours.

ENGINE **Make** Cummins Dsl **Type** eight cylinder vee with turbocharger **Serial No.** 20201005 **Crankshaft** lengthwise **Rated rpm** 2550 to 2850 **Bore and stroke** 4.625" x 4.125" **Compression ratio** 17.0 to 1 **Displacement** 555 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two cartridges **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: **Type** Four-wheel drive with duals **Serial No.** 555 80 131075 **Tread width** rear 60" to 125" front 60" to 125" **Wheel base** 120" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 72.0" Vertical distance above roadway 41.0" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 2.0 second 2.3 third 2.7 fourth 3.0 fifth 3.6 sixth 4.1 seventh 4.7 eighth 5.6 ninth 6.3 tenth 7.5 eleventh 9.5 twelfth 10.9 thirteenth 13.0 fourteenth 14.7 fifteenth 17.4 reverse 3.0, 3.6, 4.1, 4.7, 5.6 **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** dual caliper disc operated hydraulically by foot pedal or mechanically by hand lever **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 227.5" left 227.5" **Turning space diameter** (on concrete surface without brake) right 465" left 465" **Power take-off** 1000 rpm at 2667 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 160°F. Ten gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1331.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1331—VERSATILE 555 DIESEL 15-SPEED

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LUGGING ABILITY IN RATED GEAR (8th M-3)

Crankshaft Speed rpm	2850	2568	2283	1992	1710	1418	1140
Pounds Pull	10579	11965	13208	14256	14457	14502	14325
Increase in Pull %	0	13	25	35	37	37	35
Horsepower	153.91	155.99	152.32	142.69	124.15	103.13	82.01
Miles Per Hour	5.46	4.89	4.32	3.75	3.22	2.67	2.15
Slip of Drivers %	3.45	3.92	4.38	4.69	5.00	5.00	4.69

TRACTOR SOUND LEVEL WITH CAB

	2850 RPM dB(A)	2550 RPM dB(A)
Maximum Available Power 2 Hours	82.5	79.0
75% of Pull at Max. Power 10 Hours	82.5	.....
50% of Pull at Max. Power 2 Hours	86.0	.....
50% of Pull at Reduced Engine Speed 2 Hours	79.5	.....
Bystander in 15th (H-5) gear	89.0	.....

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 18.4-38; 8; inner 16; outer 14	Four 18.4-38; 8; inner 16; outer 14
Ballast	—Liquid (each inner)	1385 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Four 18.4-38; 8; inner 16; outer 14	Four 18.4-38; 8; inner 16; outer 14
Ballast	—Liquid (each)	890 lb	None
	Cast Iron (each)	None	None
Height of drawbar		18.5 in	18.5 in
Static weight with operator—rear		10280 lb	7510 lb
	Front	15700 lb	12140 lb
	Total	25980 lb	19650 lb

NEBRASKA TRACTOR TEST 1332—VERSATILE 875 DIESEL 12-SPEED

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1008 rpm)								
247.16	2100	15.390	0.439	16.06	182	56	75	28.940
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
226.25	2263	15.366	0.479	14.72	180	56	75	......
0.00	2408	5.140	......	......	174	58	75	......
118.05	2357	11.378	0.680	10.38	176	57	76	......
247.20	2100	15.361	0.438	16.09	181	57	75	......
59.73	2386	7.725	0.913	7.73	174	57	75	......
174.73	2327	13.741	0.555	12.72	178	57	76	......
Av 137.66	**2307**	**11.452**	**0.587**	**12.02**	**177**	**57**	**75**	**28.937**

DRAWBAR PERFORMANCE AT 2100 RPM

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 7th (2-3) Gear											
217.55	12386	6.59	2101	2.97	15.164	0.492	14.35	178	39	43	28.830
75% of Pull at Maximum Power—Ten Hours 7th (2-3) Gear											
184.02	9425	7.32	2316	2.25	14.690	0.565	12.53	176	30	32	28.778
50% of Pull at Maximum Power—Two Hours 7th (2-3) Gear											
126.53	6312	7.52	2360	1.49	12.239	0.684	10.34	177	27	29	28.800
50% of Pull at Reduced Engine Speed—Two Hours 11th (3-3) Gear											
126.55	6307	7.52	1214	1.53	7.982	0.446	15.85	176	32	36	28.765
MAXIMUM POWER IN SELECTED GEARS											
197.74	26795	2.77	2100	14.97	2nd (1-2) Gear			177	40	47	29.110
214.79	23364	3.45	2100	7.83	3rd (1-3) Gear			178	39	44	28.870
218.82	19963	4.11	2101	5.60	4th (1-4) Gear			178	39	45	28.880
221.66	17092	4.86	2100	4.32	5th (2-1) Gear			178	38	45	28.880
220.97	14552	5.69	2100	3.59	6th (2-2) Gear			178	34	44	28.910
221.00	12569	6.59	2100	3.01	7th (2-3) Gear			177	36	40	28.970
220.38	10733	7.70	2100	2.42	8th (2-4) Gear			178	34	44	28.890
216.15	8362	9.69	2099	1.92	9th (3-1) Gear			177	34	44	28.880

LUGGING ABILITY IN RATED GEAR (7th 2-3)

Crankshaft Speed rpm	2100	1895	1684	1469	1259	1052
Pounds Pull	12569	14926	17276	18557	18428	17123
Increase in Pull %	0	19	37	48	47	36
Horsepower	221.00	235.22	240.28	223.87	190.69	148.65
Miles Per Hour	6.59	5.91	5.22	4.52	3.88	3.26
Slip of Drivers %	3.01	3.83	4.32	4.81	4.97	4.48

TRACTOR SOUND LEVEL WITH CAB

	2100 RPM dB(A)	1900 RPM dB(A)	1750 RPM dB(A)
Maximum Available Power 2 Hours	82.0	81.5	82.0
75% of Pull at Max. Power 10 Hours	82.5	......	......
50% of Pull at Max. Power 2 Hours	82.5	......	......
50% of Pull at Reduced Engine Speed 2 Hours	81.5	......	......
Bystander in 12th (3-4) gear	91.0	......	......

DRAWBAR PERFORMANCE AT 1750 RPM

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 7th (2-3) Gear											
239.78	16577	5.42	1751	4.20	14.562	0.429	16.47	178	36	41	28.660

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Department of Agricultural Engineering

Dates of Test: October 30 to November 13, 1979

Manufacturer: Versatile Manufacturing Co., 1260 Clarence Avenue, Winnipeg, Manitoba R3T 1T3

FUEL, OIL AND TIME: **Fuel** No. 2 Diesel **Cetane No.** 49.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8474 **Fuel weight** 7.056 lbs/gal **Oil SAE** 30 **API service classification** SB/SE-CA/CD **To motor** 9.850 gal **Drained from motor** 6.145 gal **Transmission and hydraulic lubricant** Esso Hydraul 56 or equivalent **Final drive lubricant** SAE 90 **Total time engine was operated** 53.5 hours.

ENGINE Make Cummins Diesel **Type** six cylinder vertical with turbocharger **Serial No.** 10866155 **Crankshaft** lengthwise **Rated rpm** 1750 to 2100 **Bore and stroke** 5.5" x 6.0" **Compression ratio** 14.1 to 1 **Displacement** 855 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two cartridges **Muffler** vertical **Cooling medium temperature control** one thermostat.

CHASSIS: Type four-wheel drive with duals **Serial No.** 875 80 054398 **Tread width** rear 72" to 122" front 72" to 122" **Wheel base** 130" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 80" Vertical distance above roadway 42" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Advertised speeds mph** first 2.7 second 3.1 third 3.6 fourth 4.1 fifth 4.8 sixth 5.6 seventh 6.5 eighth 7.5 ninth 9.4 tenth 10.9 eleventh 12.6 twelfth 14.6 reverse 3.5, 4.0, 4.6, 5.4 **Clutch** two dry discs operated by foot pedal **Brakes** dual caliper disc operated hydraulically by foot pedal and mechanically by hand lever **Steering** hydrostatic and articulated **Turning radius** (on concrete surface without brake) right 239" left 239" **Turning space diameter** (on concrete surface without brake) right 490" left 490" **Power take-off** 1008 rpm at 2100 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 142°F. Eight gears were chosen between 15% slip and 10 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1332.

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
H. W. Ottoson, Director

NEBRASKA TRACTOR TEST 1332—VERSATILE 875 DIESEL 12-SPEED

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MAXIMUM POWER IN SELECTED GEARS

209.13	26579	2.95	1942	14.84	3rd (1-3) Gear	177	38	44	29.110
220.91	26226	3.16	1751	12.81	4th (1-4) Gear	178	39	46	29.110
231.96	22016	3.95	1752	6.77	5th (2-1) Gear	179	39	45	28.880
238.19	19113	4.67	1752	5.21	6th (2-2) Gear	178	34	44	28.900
240.98	16652	5.43	1750	4.16	7th (2-3) Gear	178	35	43	28.940
242.03	14273	6.36	1752	3.42	8th (2-4) Gear	178	34	44	28.890
240.43	11223	8.03	1752	2.68	9th (3-1) Gear	178	36	45	28.880

DRAWBAR PERFORMANCE AT 1900 RPM

					Fuel Consumption			Temp Degrees F			
Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Gal per hr	Lb per hp-hr	Hp-hr per gal	Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
Maximum Available Power—Two Hours 7th (2-3) Gear											
234.34	14853	5.92	1899	3.63	14.810	0.446	15.82	178	35	40	28.685
MAXIMUM POWER IN SELECTED GEARS											
237.02	15028	5.91	1899	3.83	7th (2-3) Gear			177	35	40	28.690

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Four 20.8-38; 8; inner 16; outer 14	Four 20.8-38; 8; inner 16; outer 14
Ballast	—Liquid (each inner)	920 lb	None
	Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi	Four 20.8-38; 8; inner 16; outer 14	Four 20.8-38; 8; inner 16; outer 14
Ballast	—Liquid (each inner)	1160 lb	None
	Cast Iron (each)	None	None
Height of drawbar		20 in	20 in
Static weight with operator—rear		11740 lb	9900 lb
	front	17740 lb	15420 lb
	Total	29480 lb	25320 lb

Nebraska Tractor Tests Summarized (Tests from 1970 through 1979)

						ENGINE									—FUEL CONSUMPTION (HP Hours Per Gallon) @:—				
																PTO	—Varying Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Draw-bar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	Average @ Varying Power	Max. Avail-able Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Allis-Chalmers																			
175	1156	Gas.	8400	2010	4	4.000x4.500	226	1800	60.88	540	56.02	53.17	5.50	6875	11.78	9.44	10.22	9.64	8.20
175	1043	Die.	8400	2460	4	3.875x5.000	235.9	2000	62.47	540	54.62	55.27	4.74	6407	15.07	13.18	12.73	13.33	11.91
185	1044	Die.	9400	2646	6	3.875x4.250	301	2200	74.87	540	70.72	65.07	4.58	7568	14.57	11.57	12.00	11.89	10.01
Two-Ten	1065	Die.	18045	5620	6	4.250x5.000	426	2200	122.74	1000	122.40	106.35	4.45	14023	15.21	11.79	13.14	11.85	9.70
5020	1270		3358	1298	2	3.62x3.74	77	2500	21.79	540	20.78	18.05	5.74	2346	13.99	11.77	11.07	10.51	8.62
5030	1271	Die.	3876	1346	2	3.82x3.94	90.1	2500	26.42	540	25.61	23.92	4.26	3389	13.82	11.28	11.64	11.48	9.68
5040	1230	Die.	6240	2180	3	3.740x4.330	143	2400	40.05	540	36.69	35.86	5.00	4837	15.47	11.80	12.58	12.74	10.44
5050 Diesel	1240	Die.	7960	3550	3	4.055x4.330	168	2700	51.46	540	47.16	45.22	5.68	6075	16.10	12.42	12.58	13.01	11.24
7000PS Diesel	1195	Die.	12580	3030	6	3.875x4.250	301	2200	106.44	1000	105.85	92.64	6.08	9907	15.70	12.21	13.21	12.27	10.16
7020 Power Shift	1259	Die.	15610	3840	6	3.875x4.250	301	2300	123.79	1000	123.50	105.36	6.59	12001	16.01	12.45	13.10	12.25	10.34
7020 Power Director	1260	Die.	15655	4085	6	3.875x4.250	301	2300	123.85	1000	125.51	107.36	6.63	11964	16.08	12.12	13.09	12.08	10.13
7030 Diesel	1119	Die.	16560	4130	6	4.250x5.000	426	2300	130.98	1000	131.14	113.28	4.94	12610	15.45	11.76	12.92	11.90	9.91
7040 Diesel	1166	Die.	17380	5585	6	4.250x5.000	426	2300	136.49	1000	136.26	116.21	6.58	13619	15.35	11.78	12.94	11.86	9.80
7040PS Diesel	1196	Die.	17355	4977	6	4.250x5.000	426	2300	136.30	1000	136.15	117.75	4.61	13547	15.51	11.95	13.05	12.29	10.39
7045 Power Director	1261	Die.	18980	4645	6	4.250x5.000	426	2300	146.18	1000	146.46	127.84	7.04	15430	14.62	11.26	12.16	11.40	9.72
7045 Powershift Diesel	1308	Die.	18990	4390	6	4.25x5.00	426	2300	146.88	1000	146.67	127.17	4.92	15449	14.92	11.32	12.58	11.71	9.62
7050 Diesel	1120	Die.	19530	5005	6	4.250x5.000	426	2300	156.49	1000	156.63	135.11	5.47	16206	16.04	12.69	13.47	12.67	10.53
7060 Diesel	1167	Die.	20490	6500	6	4.250x5.000	426	2300	161.51	1000	160.44	140.59	6.94	17370	15.99	12.71	13.63	12.75	10.55
7060PS Diesel	1197	Die.	20560	5915	6	4.250x5.000	426	2300	161.42	1000	161.65	144.13	4192	17851	16.08	12.76	13.80	12.98	10.79
7080 Diesel	1168	Die.	21720	7115	6	4.250x5.000	426	2550	181.51	1000	181.51	153.78	4.58	18478	15.71	12.24	13.23	12.11	10.02
7580 4WD	1229	Die.	25000	1490	6	4.250x5.000	426	2550	186.35	1000	186.35	160.79	6.91	23310	14.81	11.47	12.22	11.39	9.40
8550 Diesel	1262	Die.	29360	2320	6	5.250x5.625	731	2500	253.88	1000	253.88	223.39	7.24	26220	14.57	10.94	12.47	11.45	9.35
Belarus																			
MTZ 80 Diesel	1139	Die.	11575	3735	4	4.331x4.921	288.7	2200	74.79	1000	73.88	65.64	5.08	8141	15.30	13.07	13.12	13.12	11.32
250 Diesel	1183	Die.	5490	939	2	4.134x4.724	127	1800	24.95	540	25.02	21.81	4.54	2280	15.56	13.23	13.19	13.20	11.80
T25A Diesel	1200	Die.	5490	939	2	4.134x4.724	127	1800	28.70	540	28.15	24.46	4.51	2570	13.95	13.46	12.21	13.48	11.94
David Brown																			
885 Gasoline	1143	Gas.	6550	2530	3	3.939x4.000	146.1	2200	39.26	1000†	37.26	32.92	4.61	5308	10.96	8.19	7.55	7.00	7.21
885 Diesel	1137	Die.	6480	2125	3	3.939x4.500	164.4	2200	43.20	1000†	40.87	37.16	4.57	5135	16.61	14.03	13.85	13.73	12.67
990 Diesel	1144	Die.	9350	4690	4	3.939x4.000	194.9	2200	53.77	1000†	50.48	46.34	5.54	7335	15.53	13.23	13.37	12.91	11.14
995 Diesel	1136	Die.	9475	4325	4	3.939x4.500	219	2200	58.77	1000†	55.33	50.42	5.44	7317	16.60	13.94	13.78	13.60	12.40
1210 Diesel	1142	Die.	10440	4640	4	3.939x4.500	219	2300	65.98	1000†	59.50	57.23	6.16	8097	16.40	14.43	13.61	14.36	12.93
1212 Diesel	1138	Die.	10435	4030	4	3.939x4.500	219	2300	65.38	1000†	58.25	54.10	6.92	8137	15.35	13.84	12.56	13.27	11.82
Case																			
770 Manual	1088	Die.	12300	2230	4	4.125x5.000	267	2000	63.90	540	62.85	57.12	5.07	8853	15.16	12.43	13.20	12.67	10.64
770 Power Shift	1058	Die.	10950	1730	4	4.125x5.000	267	1900	56.77	538	56.77	52.05	4.30	7627	15.08	12.35	13.76	12.58	11.00
770 Power Shift	1089	Die.	12375	2215	4	4.125x5.000	267	2000	64.56	540	61.93	57.57	4.28	8927	14.72	12.22	12.62	12.45	10.53
770 Manual	1061	Gas.	10545	1736	4	4.000x5.000	251	1900	56.32	538	56.32	50.09	4.57	7474	11.19	7.82	9.83	8.17	6.53
870 Manual	1077	Die.	13520	3450	4	4.625x5.000	336	2000	78.08	1000	76.63	70.19	5.03	9733	15.46	13.01	13.35	13.44	11.89
870 Power Shift	1076	Die.	13550	3320	4	4.625x5.000	336	2000	77.92	1000	77.11	67.47	4.23	10075	14.42	12.15	12.13	12.41	11.10
870 Manual	1060	Gas.	11705	2786	4	4.375x5.000	301	1900	71.06	538	71.06	63.04	5.82	9105	11.86	8.63	10.09	8.76	7.47
870 Manual Diesel	1149	Die.	13510	3435	4	4.625x5.000	336	2100	80.20	1000	77.93	71.09	5.23	10047	14.52	12.13	12.42	12.53	10.88
870 Power Shift	1150	Die.	13760	3664	4	4.625x5.000	336	2100	80.49	1000	76.52	71.04	4.39	10030	13.64	11.60	11.49	12.04	10.88
970 Manual	1034	Die.	13700	3516	6	4.125x5.000	401	1900	85.70	538	35.70	73.28	3.81	10604	15.64	12.79	12.79	12.93	11.48
970 Manual	1078	Die.	14470	3390	6	4.125x5.000	401	2000	93.87	1000	92.11	81.27	4.91	10644	15.51	12.75	13.53	13.26	11.50
970 Power Shift	1037	Die.	13870	3536	6	4.125x5.000	401	1900	85.31	538	85.31	74.53	4.28	10671	15.71	12.71	13.51	12.85	11.49
970 Power Shift	1068	Die.	14510	3320	6	4.125x5.000	401	2000	93.41	1000	93.47	81.90	6.13	11009	15.11	12.31	12.88	12.37	12.12
970 Manual	1039	Gas.	13540	3492	6	4.000x5.000	377	1900	85.02	538	85.02	79.66	4.66	10540	10.34	7.53	8.99	8.40	6.86
970 Power Shift	1038	Gas.	13665	3536	6	4.000x5.000	377	1900	85.23	538	85.23	76.79	5.79	10567	10.15	7.55	8.96	8.15	6.99

1070, 1090 Manual	1035	Die.	14995	4686	6	4.375x5.000	451	2000	100.73	1000	96.50	85.18	4.90	11203	15.70	12.70	13.70	12.82	11.17
1070 Manual	1067	Die.	17520	6110	6	4.375x5.000	451	2100	107.36	1000	103.91	93.70	4.50	13161	15.75	12.42	13.05	12.62	11.34
1070, 1090 Power Shift	1036	Die.	15140	4640	6	4.375x5.000	451	2000	100.21	1000	98.74	85.75	4.99	10912	15.90	12.80	12.93	12.98	11.65
1070 Power Shift	1066	Die.	17675	6165	6	4.375x5.000	451	2100	108.10	1000	99.92	95.37	4.44	13780	15.44	12.43	12.62	12.68	11.04
1170	1062	Die.	18520	4980	6	4.375x5.000	451	2100	121.93	1000	118.13	110.93	4.21	13730	16.46	12.86	13.94	13.09	11.31
1270	1103	Die.	17625	4185	6	4.375x5.000	451	2100	126.70	1000	126.60	109.77	6.79	12690	14.52	11.05	12.13	11.55	9.81
1270	1160	Die.	18910	3440	6	4.375x5.000	451	2100	135.39	1000	135.41	121.83	6.46	15648	14.23	11.14	12.16	11.49	9.88
1370	1102	Die.	20960	5670	6	4.625x5.000	504	2100	142.51	1000	143.64	123.01	4.78	16609	15.37	11.45	12.73	11.82	10.16
1370 Diesel	1148	Die.	20290	4945	6	4.625x5.000	504	2200	155.56	1000	156.32	134.25	5.00	16480	15.01	10.95	12.04	10.91	9.109
1410 Manual	1209	Die.	10910	3160	4	3.939x4.500	219	2300	80.88	540	79.35	69.25	5.32	7846	17.47	14.69	14.20	14.38	12.45
1410 Power Shift	1210	Die.	10990	3150	4	3.939x4.500	219	2300	80.61	540	76.21	67.98	7.90	7816	16.86	13.76	13.34	13.21	11.45
1570	1218	Die.	20350	4060	6	4.625x5.000	504	2100	180.41	1000	180.41	152.96	5.02	17115	15.09	12.47	12.72	12.46	10.88
2090 Manual Diesel	1304	Die.	15030	3120	6	4.625x5.000	504	2100	108.74	1000	108.74	94.99	4.60	11655	15.40	12.23	13.41	12.69	10.73
2090 Power Shift	1295	Die.	15190	3160	6	4.625x5.00	504	2100	108.29	1000	108.29	93.60	4.81	11211	14.94	11.77	12.49	11.96	10.14
2290 Manual Diesel	1296	Die.	15400	2630	6	4.625x5.000	504	2100	128.80	1000	128.80	109.36	5.32	12635	14.52	11.66	12.46	11.73	10.07
2290 Powershift Diesel	1297	Die.	15840	2140	6	4.625x5.000	504	2100	129.08	1000	129.08	111.68	6.25	12749	13.76	11.53	12.65	11.37	9.77
2390 Powershift Diesel	1302	Die.	18710	3120	6	4.625x5.000	504	2100	160.72	1000	160.72	146.01	6.59	16020	15.23	12.41	13.20	12.66	10.99
2470	1114	Die.	20485	None	6	4.625x5.000	504	2200	174.20	1000	174.20	154.24	5.67	18050	15.22	12.33	13.30	12.55	10.86
2590 Powershift Diesel	1303	Die.	20500	4760	6	4.625x5.000	504	2100	180.38	1000	180.38	159.01	6.57	17865	15.53	12.97	13.42	13.03	11.67
2670 Diesel	1165	Die.	25260	4450	6	4.625x5.000	504	2200	219.44	1000	291.44	194.60	5.28	23618	15.29	12.59	13.42	12.60	10.88
2870 Diesel	1241	Die.	28150	3050	6	5.000x5.710	673	2200	252.10	1000	252.10	219.61	5.72	26386	15.45	12.01	12.98	12.37	10.40
M-B 4/94	1211	Die.	13110	4620	6	3.819x5.039	346	2550	73.33	1000†	70.17	66.33	5.33	10558	15.13	10.68	12.55	11.65	9.49
4490 Diesel	1328	Die.	22450	1610	6	4.625x5.000	504	2200	175.20	1000	175.20	152.80	7.14	21400	15.27	12.36	13.30	12.52	10.87
4690 Diesel	1329	Die.	25230	2920	6	4.625x5.000	504	2200	219.62	1000	219.62	195.60	5.97	24564	15.26	12.76	13.39	12.84	11.21
4890 Diesel	1330	Die.	28460	2710	6	5.00x5.71	673	2200	253.41	1000	253.41	224.81	5.96	27627	16.32	13.02	14.19	13.27	11.36
John Deere																			
830 Diesel	1146	Die.	5714	1338	3	3.860x4.330	152	2400	35.30	540	32.62	28.46	5.19	4252	14.74	11.37	11.84	11.03	9.09
850	1280	Die.	3528	992	3	3.15x3.35	78	2600	22.27	540	20.66	18.92	4.90	2699	14.26	11.51	11.23	11.22	10.21
950	1281	Die.	3615	803	3	3.54x3.54	105	2400	27.36	540	28.05	23.46	4.98	3056	14.68	12.36	12.42	12.23	10.63
1050 Diesel	1327	Die.	4140	730	3	3.54x3.54	105	2400	33.41	540	33.42	28.15	5.27	3466	15.46	12.36	12.34	11.99	10.13
1530 Diesel	1147	Die.	6863	1909	3	4.020x4.330	164	2500	45.38	540	41.36	38.86	5.58	5139	14.28	11.20	12.04	11.47	9.78
2030	1085	Die.	7430	2060	4	4.020x4.330	219	2500	60.65	540	55.23	52.33	5.92	6472	16.26	12.16	12.73	11.82	10.53
2030	1084	Gas.	7430	2200	4	4.020x4.330	219	2500	60.34	540	55.38	51.33	5.93	6340	11.59	7.69	8.65	7.66	5.88
2040 Diesel	1191	Die.	6420	1620	3	4.020x4.330	164	2500	40.86	540	37.62	34.15	5.64	4634	15.50	11.18	11.87	11.15	9.51
2240 Diesel	1192	Die.	7340	2390	3	4.190x4.330	179	2500	50.37	540	46.78	41.28	5.54	5433	15.20	11.08	11.57	11.18	9.51
2630	1157	Die.	8430	2630	4	4.190x5.000	276	2500	70.37	540	69.02	58.15	5.38	6470	16.01	10.89	12.10	10.98	8.95
2840 Diesel	1249	Die.	10500	1695	6	4.020x4.330	329	2500	80.65	1000	76.27	67.47	6.21	8386	16.02	11.52	12.36	11.57	9.59
4030 Quad-Range	1111	Die.	10150	970	6	4.000x4.330	329	2500	80.33	1000	77.72	68.76	6.10	7512	15.40	10.69	11.71	10.99	8.92
4040 Diesel	1267	Die.	12055	1165	6	4.250x4.750	404	2200	90.80	1000	90.80	76.81	7.02	8936	13.49	10.59	11.24	10.96	9.21
4240 Diesel	1266	Die.	14090	1695	6	4.5625x4.75	466	2200	110.94	1000	110.94	95.18	5.42	11492	14.33	11.09	12.05	11.35	9.52
4230 Quad-Range	1112	Die.	14150	3250	6	4.250x4.750	404	2200	100.32	1000	100.32	86.36	6.65	11116	14.10	11.61	12.02	11.92	10.10
4320 Syncro-Range	1050	Die.	14380	3706	6	4.250x4.750	404	2200	116.55	1000	108.02	104.49	6.45	11783	15.35	9.46	12.73	11.77	9.75
4430 Quad-Range	1110	Die.	15060	3710	6	4.250x4.750	404	2200	125.88	1000	125.88	108.46	6.58	12032	15.56	12.13	12.94	11.96	10.17
4440 Diesel	1265	Die.	15540	2270	6	4.5625x4.75	466	2200	130.58	1000	130.58	112.56	5.02	13392	15.21	11.73	12.69	11.83	9.90
4620 Power Shift	1064	Die.	18585	3655	6	4.250x4.750	404	2200	135.62	1000	130.79	115.58	4.73	14471	15.70	11.35	12.23	11.27	9.16
4620 Syncro-Range	1073	Die.	18640	3840	6	4.250x4.750	404	2200	135.76	1000	130.27	117.38	5.08	13916	15.57	11.51	12.66	11.86	9.91
4630 Power Shift	1113	Die.	16250	None	6	4.250x4.750	404	2200	150.66	1000	150.66	134.56	10.26	14478	15.68	12.43	13.34	12.88	10.59
4640 Diesel	1264	Die.	18120	None	6	4.5625x4.75	466	2200	156.30	1000	156.30	137.40	6.45	15362	15.61	12.29	13.30	12.15	10.32
4840 Diesel	1263	Die.	20370	2240	6	4.5625x4.75	466	2200	180.63	1000	181.63	157.09	4.76	17307	15.85	12.47	13.35	12.54	10.76
6030	1100	Die.	18180	None	6	4.750x5.000	531	2100	175.99	1000	175.99	155.42	6.65	15303	15.82	12.70	13.52	12.72	11.04
7020	1063	Die.	19570	1075	6	4.250x4.750	404	2200	146.17	1000	146.17	131.50	5.34	18726	14.28	11.41	12.82	11.81	9.51
7520	1101	Die.	22320	None	6	4.750x5.000	531	2100	175.82	1000	175.82	165.21	5.69	22517	15.18	12.37	13.76	12.82	10.97
8430 Diesel	1179	Die.	23100	290	6	4.563x4.750	466	2100	178.16	993	178.16	160.39	5.56	22503	15.12	11.96	13.44	12.64	10.42
8630 Diesel	1180	Die.	26480	1950	6	5.125x5.000	619	2100	225.59	993	225.59	202.31	4.58	26443	15.34	12.27	13.67	12.80	10.78
8440 Diesel	1323	Die.	26590	None	6	4.563x4.75	466	2100	179.83	1000	179.83	163.26	4.97	25383	15.86	12.55	14.29	13.06	11.25
8640 Diesel	1324	Die.	28270	None	6	5.125x5.00	619	2100	228.75	1000	228.75	208.38	4.63	27782	15.61	12.40	14.06	13.14	11.16
Deutz																			
4006	1075	Die.	7005	2520	3	3.940x4.720	172.5	2150	36.95	540	32.15	32.30	5.00	5043	17.76	13.93	14.84	14.00	12.78
D4506	1131	Die.	7390	2880	3	3.940x4.720	172.5	2300	43.15	540	42.17	37.07	4.68	5472	18.02	14.12	14.49	14.05	12.46
5506	1104	Die.	9780	4490	4	3.940x4.720	230	2300	56.08	540	52.88	48.81	6.33	6996	17.77	13.84	14.37	13.69	12.06
6006	1091	Die.	11250	4920	4	3.940x4.720	230	2300	65.30	1000	63.93	58.15	7.02	8623	15.26	13.53	13.02	13.64	11.75
D6206	1219	Die.	8780	3410	4	3.937x4.724	230	2050	60.23	540	57.00	52.41	6.04	6944	17.58	15.43	15.10	15.34	14.05

Nebraska Tractor Tests Summarized (Tests from 1970 through 1979)

					ENGINE										—FUEL CONSUMPTION (HP Hours Per Gallon) @:—				
																PTO	—Varying Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cyl-inders	Bore and Stroke	Dis-place-ment Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Draw-bar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	Average @ Varying Power	Max. Avail-able Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Deutz (cont.)																			
D6806	1220	Die.	11000	4605	4	3.937x4.724	230	2300	68.18	540	62.52	61.87	7.15	9095	16.39	14.73	14.63	15.05	13.52
8006	1074	Die.	11060	4210	6	3.940x4.720	345	2100	85.51	1000	81.18	74.46	6.73	8898	16.87	14.57	13.91	14.17	12.76
10006	1105	Die.	14440	6060	6	3.940x4.720	345	2400	105.04	1000	101.19	90.92	5.80	9979	14.39	13.46	12.14	13.52	1170
13006	1092	Die.	15980	6375	6	3.940x4.720	345	2400	125.71	1000	133.27	114.85	8.47	10677	17.39	14.10	14.36	13.87	12.07
D13006	1130	Die.	16125	4075	6	3.940x4.720	345	2400	125.77	1000	126.19	110.24	5.74	13509	17.71	14.00	14.97	13.83	11.95
DX-90 Diesel	1305	Die.	13150	3210	5	3.94x4.72	287	2300	84.47	1000	80.82	74.19	6.53	8766	16.45	14.15	13.81	14.07	12.39
DX-110 Diesel	1306	Die.	14940	2360	6	3.94x4.72	345	2300	100.29	1000	93.61	90.82	7.00	11773	15.10	13.71	13.52	14.03	12.60
DX-160 Diesel	1307	Die.	18710	3870	6	4.02x4.92	374	2200	145.41	1000	140.99	124.24	5.63	15172	17.82	14.47	14.56	13.95	11.93
Fiat																			
420	1293	Die.	6035	2115	3	3.74x4.33	143	2200	41.34	540	37.45	37.71	5.65	5299	14.81	12.93	13.30	13.92	12.35
580	1292	Die.	9210	2580	3	4.055x4.33	168	2700	51.61	540	48.42	44.20	3.38	8899	14.93	12.59	12.14	12.70	10.50
780	1294	Die.	10230	2830	4	4.055x4.33	224	2500	70.36	540	66.30	64.43	4.06	7776	15.41	13.62	13.93	14.17	12.50
Ford																			
1600 Diesel	1228	Die.	3840	1150	2	3.543x3.937	77.6	2500	23.02	540	19.78	18.53	5.76	2634	14.14	11.82	11.26	11.45	9.72
1700 Diesel	1325	Die.	3725	1110	2	3.54x3.94	77.6	2500	2326	540	23.02	20.21	5.54	2801	13.02	11.21	10.89	11.48	10.41
1900 Diesel	1326	Die.	4160	1225	3	3.35x3.31	87.2	2800	26.88	540	25.68	23.49	6.20	29.64	12.58	10.38	10.41	10.89	9.32
2000 6-Speed	1054	Gas.	5995	1946	3	4.200x3.800	158	2000	30.58	540	29.24	27.13	4.00	4535	11.00	8.17	9.48	8.85	6.97
2000 6-Speed	1053	Die.	6000	1902	3	4.200x3.800	158	2000	31.97	540	30.05	27.49	5.50	4452	16.22	12.70	13.47	12.78	10.93
2600 6-Speed	1204	Die.	5990	1550	3	4.200x3.800	158	2000	32.38	540	30.51	27.93	5.57	4591	14.88	11.51	12.27	11.74	10.22
2600 6-Speed	1206	Gas.	6000	1645	3	4.200x3.800	158	2000	32.78	540	31.03	28.25	5.57	4198	11.14	7.89	8.83	8.17	6.73
2600 8-Speed	1222	Die.	6000	460	3	4.200x3.800	158	2000	32.47	540	30.76	28.18	5.56	4452	14.62	11.18	11.94	11.22	9.18
2600 8-Speed	1207	Gas.	6000	1710	3	4.200x3.800	158	2000	34.18	540	32.07	30.20	5.49	4455	11.54	8.38	9.45	8.64	7.15
3000 6-Speed	1051	Gas.	6890	2750	3	4.200x3.800	158	2100	38.33	540	34.34	32.40	5.84	5109	11.23	8.40	9.26	9.00	7.27
3000 6-Speed	1052	Die.	6895	2676	3	4.200x4.200	175	2000	40.63	540	39.07	35.88	5.51	5206	15.94	13.18	13.57	13.30	11.63
3600 6-Speed	1203	Die.	6860	2445	3	4.200x4.200	175	2000	40.49	540	37.64	34.47	5.96	5114	15.32	12.12	12.84	12.34	9.97
3600 6-Speed	1208	Gas.	6900	2665	3	4.200x4.200	175	2000	40.17	540	37.91	35.53	5.91	5158	11.23	8.07	9.29	8.77	7.05
3600 8-Speed	1221	Die.	6890	1300	3	4.200x4.200	175	2000	40.55	540	38.31	34.10	5.96	5277	15.33	12.40	12.93	12.51	10.36
3600 8-Speed	1226	Gas.	6900	1500	3	4.200x4.200	175	2000	40.62	540	38.29	35.90	5.93	5123	11.42	8.16	9.02	8.57	6.88
4100 8-Speed	1202	Die.	7500	2590	3	4.200x4.400	183	2000	45.46	540	41.13	41.14	4.63	5557	15.59	11.57	12.47	11.96	10.36
4600 8-Speed	1223	Die.	8220	2340	3	4.400x4.400	201	2200	52.44	540	46.31	45.57	5.24	6342	14.59	11.49	11.82	11.85	10.77
5600 8-Speed	1201	Die.	9690	3785	4	4.200x4.200	233	2100	60.46	540	56.85	52.22	5.49	7105	15.77	12.83	12.87	12.88	11.02
5600 16-Speed	1227	Die.	9690	2380	4	4.200x4.200	233	2100	58.46	540	56.00	49.79	5.36	7140	15.06	11.94	12.07	11.94	10.42
6600 8-Speed	1217	Die.	9660	3780	4	4.400x4.200	256	2100	70.56	1000	70.07	61.36	6.91	7131	15.43	12.86	12.28	12.71	11.35
6600 16-Speed	1224	Die.	9700	2680	4	4.400x4.200	256	2100	68.10	1000	68.05	58.74	5.22	7267	14.97	12.64	12.05	12.77	11.05
6700 16-Speed	1244	Die.	9690	1180	4	4.400x4.200	255	2100	68.94	1000	68.62	58.06	7.55	6787	13.77	12.23	11.24	12.38	11.16
7000	1093	Die.	10795	4580	4	4.400x4.200	256	2100	83.49	540	78.81	71.42	5.71	8138	16.64	13.53	13.21	12.86	11.51
7600 16-Speed	1225	Die.	10760	3320	4	4.400x4.200	256	2100	84.79	1000	85.16	67.95	5.61	7779	15.95	12.35	12.44	11.77	9.92
7700 16-Speed	1242	Die.	10800	2400	4	4.400x4.200	255	2100	84.38	1000	84.29	71.57	7.28	7688	15.24	11.65	11.92	11.21	9.71
8700 16-Speed	1245	Die.	14760	2490	6	4.400x4.400	401	2300	110.58	1000	99.56	100.12	6.94	11581	15.02	11.91	12.37	12.28	10.93
8600 Dual Power	1121	Die.	14790	3360	6	4.400x4.400	401	2300	110.69	1000	99.32	93.62	4.88	11363	15.69	12.84	12.71	12.74	11.19
9600 Dual Power	1122	Die.	18000	6140	6	4.400x4.400	401	2200	135.46	1000	128.46	116.40	6.65	12203	16.88	12.99	13.31	12.64	11.06
9700 16-Speed	1243	Die.	17480	4620	6	4.400x4.400	401	2200	135.64	1000	129.25	118.08	6.55	15010	15.95	11.77	12.63	11.97	10.34
TW-10 Diesel	1301	Die.	15190	2325	6	4.4x4.4	401	2300	110.24	1000	101.09	97.24	8.25	12006	14.86	11.50	12.17	11.91	10.20
TW-20 Diesel	1300	Die.	17180	3495	6	4.4x4.4	401	2200	135.60	1000	131.43	121.47	7.85	14155	16.22	11.78	13.08	12.04	10.09
TW-30 Diesel	1299	Die.	19830	5205	6	4.4x4.4	401	2200	163.28	1000	157.04	144.17	8.32	16553	16.76	12.49	13.67	12.58	10.79
FW 20	1291	Die.	31000	1385	8	4.625x4.125	555	2850	....	....	....	156.85	5.45	27155	....	....	12.12	11.69	10.15
FW30	1288	Die.	31720	410	8	5.500x4.750	903	2600	(1)	....	....	212.02	6.64	27803	....	....	13.71	12.24	10.08
FW 30 without PTO												220.38	5.85	28302	....	....	14.16	12.73	10.96
FW 40	1290	Die.	32950	2320	8	5.500x4.750	903	2600	....	....	....	238.78	6.60	28245	....	....	13.83	12.84	10.73
FW 60	1289	Die.	33970	2870	8	5.500x4.750	903	2600	....	....	....	285.57	7.46	29304	....	....	14.90	13.38	11.27

(1) Equipped with controlled, hydrostatic pto with 105 output horsepower at 1000 rpm.

International Harvester																			
Int'l Hydro 100	1156	Die.	12765	635	6	4.300x5.000	436	2400	104.17	1000	101.30	82.13	6.42	9801	14.83	10.50	10.35	10.19	8.95
Hydro 186 Diesel	1257	Die.	13430	None	6	4.300x5.000	436	2400	105.02	1000	100.31	82.77	6.56	11312	13.68	10.06	9.83	9.84	8.46
IH 284	1277	Gas.	3596	1166	4	2.756x2.992	71.3	2600	25.75	1000	24.33	20.64	4.02	2561	11.62	9.54	9.77	8.97	7.52
Int'l 354	1115	Gas.	5925	1890	4	3.875x4.000	143.1	1875	32.58	540	32.22	28.37	5.01	4674	10.36	7.99	9.03	8.55	7.23
Int'l. 454	1097	Die.	7470	2750	3	3.875x5.060	179	2200	40.47	1000	40.47	35.83	4.10	5583	14.68	11.48	12.87	11.85	10.07
Int'l. 454	1096	Gas.	7120	2720	4	3.375x4.390	157	2200	40.86	1000	40.86	35.24	4.13	5329	10.94	8.03	9.22	8.40	7.12
Int'l. 464 Gas	1126	Gas.	7355	2460	4	3.562x4.390	175	2400	45.74	540	43.64	42.20	4.51	5465	10.80	8.00	9.65	8.86	7.70
Int'l. 464 Diesel	1127	Die.	7570	2440	3	3.875x5.060	179	2400	44.42	540	41.73	39.97	4.53	5488	14.41	11.49	12.25	12.57	10.67
484 Utility Dsl.	1312	Die.	7710	2710	3	3.875x5.06	179	2200	42.42	540	41.79	38.06	4.78	5500	14.81	11.85	12.75	12.39	10.63
Int'l. 574	1099	Die.	8675	3525	4	3.875x5.060	238.6	2200	52.55	1000	52.55	46.95	4.40	6446	14.46	11.53	12.86	12.38	10.57
Int'l. 574	1098	Gas.	8250	3415	4	3.813x4.390	200.3	2200	52.97	1000	52.97	45.16	4.39	6360	11.25	8.55	9.63	9.05	7.43
584 Utility & Rowcrop	1313	Die.	8850	3185	4	3.875x4.38	206	2300	52.54	540	50.96	47.47	5.07	6859	15.23	12.34	13.41	12.95	11.10
Int'l. 666 Gas	1152	Gas.	10050	2360	6	3.750x4.390	290.8	2000	66.30	540	66.30	58.68	5.13	7981	11.95	8.45	10.08	9.04	7.27
Int'l. 666 Diesel	1151	Die.	10330	2130	6	3.875x4.410	312	2000	66.29	540	66.29	58.34	5.12	8012	14.24	11.76	12.60	11.56	10.16
Int'l. 674 Utility Gas	1128	Gas.	8330	3035	4	3.812x4.390	200	2400	58.53	540	56.01	53.48	7.04	6583	10.83	8.19	9.40	9.11	8.39
Int'l 674 Utility Die	1129	Die.	8690	3040	4	3.875x5.060	238.6	2400	61.56	540	58.79	55.91	7.03	6833	15.25	12.16	13.52	13.11	11.31
684 Utility & Rowcrop	1314	Die.	9660	3825	4	3.875x5.06	239	2400	62.52	540	58.75	55.92	5.29	6858	15.55	12.21	13.27	13.02	11.28
784 Rowcrop Diesel	1315	Die.	9920	3830	4	3.937x5.062	246	2400	67.48	1000	64.09	58.65	5.18	8105	16.06	12.75	13.25	12.77	11.07
Hydro 84 Diesel	1316	Die.	9120	3115	4	3.937x5.062	246	2400	58.73	540	56.68	43.59	7.60	6572	14.01	10.50	10.13	9.82	8.34
Int'l. Hydro 70 Gas	1154	Gas.	10140	2265	6	3.750x4.390	290.8	2400	69.61	540	64.10	54.62	4.57	8427	11.10	7.17	7.654	6.75	5.48
Int'l. Hydro 70 Die	1155	Die.	10430	1990	6	3.875x4.410	312	2400	69.51	540	65.41	53.49	4.03	8310	12.40	9.31	9.451	8.756	6.965
Farmall 766	1117	Die.	12720	1380	6	3.875x5.085	360	2600	85.45	1000	85.66	74.54	6.48	9236	14.85	10.36	12.08	11.05	9.13
Farmall 766	1094	Gas.	11880	1480	6	3.750x4.390	290.8	2400	79.73	1000	73.96	71.44	4.77	8841	11.78	8.18	9.77	8.68	7.12
826 Diesel	1045	Die.	13840	4030	6	3.875x5.060	358	2400	92.19	1000	85.34	81.80	5.98	9631	15.42	11.89	12.76	12.32	10.55
826 Hydrostatic	1046	Die.	13840	3504	6	3.875x5.060	358	2400	84.66	1000	79.00	63.54	6.60	8780	14.15	10.45	10.12	9.64	8.46
886 Diesel	1254	Die.	13040	970	6	3.875x5.085	360	2400	86.14	1000	83.16	75.67	6.35	10485	14.29	10.55	11.77	10.92	9.21
Farmall 966	1082	Die.	13500	1875	6	4.300x4.750	414	2400	96.01	1000	93.50	82.75	4.41	10041	15.74	11.38	12.57	12.00	10.28
Farmall 966 Hydro	1095	Die.	12875	1175	6	4.300x4.750	414	2400	91.38	1000	88.29	71.43	8.51	8909	13.80	9.33	9.63	9.19	7.94
Int'l. 966 Diesel	1123	Die.	13670	1970	6	4.300x4.750	414	2600	100.80	1000	101.52	88.94	6.58	10036	15.68	10.94	12.36	11.68	9.84
986 Diesel	1255	Die.	14000	970	6	4.300x5.000	436	2400	105.68	1000	104.18	94.05	6.73	12176	15.56	11.34	12.65	11.72	10.02
1026 Hydrostatic	1047	Die.	14975	3932	6	4.321x4.625	407	2400	112.45	1000	110.71	84.34	6.66	9583	15.58	10.48	10.26	9.61	8.36
F'all 1066 Hyd.Turbo	1083	Die.	13190	1870	6	4.300x4.750	414	2400	113.58	1000	109.32	88.13	6.47	9576	15.54	10.53	10.64	10.07	8.65
Farmall 1066 Turbo	1081	Die.	15170	3025	6	4.300x4.750	414	2400	116.23	1000	112.18	103.95	6.30	11625	16.52	11.47	13.16	12.02	10.13
Int. 1066 Turbo Diesel	1124	Die.	15260	1945	6	4.300x4.750	414	2600	125.68	1000	119.20	108.87	7.03	1300	16.37	11.32	12.78	11.97	9.99
1086 w/Radial Tires	1247	Die.	15640	2925	6	4.300x4.375	414	2400	131.41	1000	133.67	115.82	7.40	13503	16.39	11.90	13.28	12.36	10.45
1086 w/Bias Ply Tires	1247	Die.	15640	3100	6	4.300x4.375	414	2400	131.41	1000	133.67	114.14	6.66	12137	16.39	11.90	12.83	12.08	10.52
1456	1048	Die.	17350	2296	6	4.321x4.625	407	2400	131.80	1000	127.27	118.35	5.00	12558	16.67	12.11	13.46	12.53	10.60
Farmall 1466 Turbo	1080	Die.	16230	2750	6	4.300x5.000	436	2400	133.40	1000	125.17	119.14	6.78	13165	16.86	12.30	13.92	12.85	10.96
Int. 1466 Turbo Diesel	1125	Die.	16660	2990	6	4.300x5.000	436	2600	145.77	1000	145.84	127.02	6.93	13673	17.03	11.83	13.03	12.01	10.35
Farmall 1468	1118	Die.	16310	2850	8	4.500x4.313	550	2600	145.49	1000	136.85	129.31	7.33	12932	15.93	12.40	13.87	13.22	11.17
Int'l 1566 Turbo Dsl	1174	Die.	18260	3065	6	4.300x5.000	436	2600	161.01	1000	162.31	140.35	5.64	15774	16.16	11.51	12.55	11.69	9.86
Int'l 1568 Diesel	1175	Die.	17350	2400	8	4.500x4.313	550	2600	150.70	1000	147.79	133.79	5.69	14918	14.99	12.08	13.00	12.59	10.80
1586 w/Radial Tires	1248	Die.	17600	2480	6	4.300x5.000	436	2500	161.55	1000	156.09	140.65	5.55	16665	16.51	12.28	13.02	12.38	10.51
1586 w/Bias Ply Tires	1248	Die.	17600	3010	6	4.300x5.000	436	2500	161.55	1000	156.09	140.08	6.05	15124	16.51	12.28	12.74	12.38	10.54
3388 Diesel	1319	Die.	17850	430	6	4.300x5.000	436	2400	130.61	1000	128.59	114.42	6.67	16764	16.85	12.00	13.52	12.17	10.09
3588 Diesel	1320	Die.	18890	1270	6	4.300x5.350	466	2400	150.41	1000	152.07	130.94	6.65	17589	16.98	12.19	13.13	12.20	10.30
Int'l. 4166	1116	Die.	20010	3685	6	4.300x5.000	436	2400	150.63	1000	152.72	130.57	5.92	19434	16.84	11.86	13.01	11.88	9.93
Int'l. 4366 Turbo D	1153	Die.	23000	1310	6	4.300x5.350	466	2600	....	....	....	168.90	6.65	23138	....	....	12.54	11.98	10.34
4386 Diesel	1256	Die.	24930	None	6	4.300x5.350	466	2600	....	....	....	176.02	8.71	23321	....	....	12.43	11.92	10.18
4568	1216	Die.	29870	4120	8	5.3125x4.50	798	2600	....	....	....	235.72	6.76	27995	....	....	12.89	11.79	9.73
4786 Diesel	1317	Die.	34350	4150	8	5.313x4.500	798	2600	....	....	....	265.55	4.79	33468	....	....	12.80	11.92	9.86
Kubota																			
L185	1285	Die.	3370	1430	2	3.000x3.23	45.3	2800	15.33	540	14.07	13.03	5.57	1939	13.60	10.90	10.38	10.82	9.26
L185DT	1286	Die.	3415	1283	2	3.000x3.23	45.3	2800	15.45	540	14.16	12.65	3.94	2322	13.49	11.00	10.34	10.24	8.70
L-210	1071	Die.	3610	1290	2	3.460x3.460	65.3	2700	19.10	540	16.49	14.69	5.03	2020	13.19	10.94	10.86	10.56	9.16
L225 Diesel	1145	Die.	3452	1457	3	3.000x3.200	....	2700	20.86	1000†	19.96	17.69	6.34	2015	14.25	11.12	10.71	10.78	9.36
L245	1283	Die.	3694	1498	3	3.000x3.23	68	2800	22.06	540	20.11	18.66	5.74	2067	13.98	11.07	10.74	10.70	9.16
L245DT	1284	Die.	3792	1410	3	3.000x3.23	68	2800	22.35	540	20.15	18.48	6.06	2419	14.33	11.21	10.88	10.67	9.22
L-260	1072	Die.	4020	1380	2	3.540x3.940	77.6	2600	24.11	540	22.88	19.64	5.12	2575	13.52	13.16	10.45	10.90	8.31
L285 Diesel	1198	Die.	4030	1585	4	2.992x3.228	91	2400	26.45	540	23.58	22.94	6.62	3134	14.63	12.16	11.78	12.16	10.65
Lamborghini																			
1056DT	1269	Die.	12050	1700	6	3.86x4.72	331	2220	92.13	1000	89.98	79.51	6.86	9135	15.16	13.02	12.45	12.74	10.93

Nebraska Tractor Tests Summarized (Tests from 1970 through 1979)

						ENGINE									—FUEL CONSUMPTION (HP Hours Per Gallon) @:—				
																PTO	—Varying Drawbar Power—		
MAKE AND MODEL OF TRACTOR	Test No.	Fuel Used	Weight With Ballast	Lbs. Ballast Carried	No. of Cylinders	Bore and Stroke	Displacement Cu. in.	Rated RPM Dwbr.	Max. PTO HP @ Rated Engine RPM	Std. PTO RPM	Max. PTO HP @ Std. PTO RPM	Max. Drawbar HP	MPH @ Max. Dwbr. HP	Max. Lbs. Pull	Max. PTO HP @ Std. PTO RPM	Average @ Varying Power	Max. Available Power	75% of Pull Max. Power	50% of Pull @ Max. Power
Leyland																			
245 Diesel	1177	Die.	7850	1970	3	3.600x5.000	152.7	2250	39.73	540	36.38	35.09	4.47	5056	16.31	12.60	13.02	12.67	11.29
255 Diesel	1176	Die.	8610	2310	4	3.822x4.826	222	2200	47.91	540	43.85	43.00	6.58	5891	16.42	11.10	12.78	11.81	9.50
2100 Diesel	1178	Die.	13260	4350	6	3.860x4.920	344.7	2100	88.40	1000	83.30	75.70	4.95	8617	16.29	13.20	13.16	13.24	11.24
Long																			
360 Diesel	1298	Die.	6410	1930	3	3.74x4.33	143	2400	36.16	540	31.06	31.91	5.20	4808	14.41	11.97	12.45	12.13	10.48
R9500 Special	1107	Die.	13700	5530	6	3.875x5.000	354	2250	97.72	540	88.13	82.94	6.13	10216	16.21	13.25	13.02	13.10	11.14
U445	1108	Die.	7800	3320	3	3.740x4.330	143	2400	41.93	540	36.53	37.55	5.51	5910	13.40	12.01	11.84	13.29	11.93
U550	1109	Die.	9110	4540	4	3.740x4.330	190.7	2400	53.61	540	47.66	48.03	7.15	6944	15.10	12.41	13.09	13.21	11.76
900 Diesel	1163	Die.	12575	4375	4	4.33x4.72	285	2200	72.88	1000	72.86	62.50	6.53	7843	13.06	12.15	10.97	13.00	11.38
Massey-Ferguson																			
MF230 Gasoline	1215	Gas.	4870	1030	4	3.375x4.062	145	2000	34.34	540	31.29	29.58	5.08	3717	11.85	8.72	9.89	8.90	7.85
MF230 Diesel	1214	Die.	5110	1110	3	3.600x5.000	153	2000	34.53	540	30.80	29.66	7.64	4030	18.18	14.81	15.06	14.74	12.87
MF235 Gasoline	1194	Gas.	5785	1655	4	3.375x4.062	145	2250	41.13	540	33.87	35.29	5.86	4294	10.49	7.99	8.69	8.07	6.69
MF235 Diesel	1187	Die.	5860	1725	3	3.600x5.000	153	2250	42.39	540	35.29	36.29	5.84	4281	16.78	13.52	13.80	13.39	11.56
MF255 Gasoline	1190	Gas.	7280	1140	4	3.875x4.500	212	2000	50.01	540	47.14	43.49	5.28	5668	10.91	8.00	8.94	8.54	6.72
245 Diesel	1251	Die.	6150	2100	3	3.600x5.000	153	2250	42.90	540	36.50	36.75	5.92	4279	16.25	12.72	12.43	12.79	11.13
245 Gasoline	1252	Gas.	6020	2120	4	3.375x4.062	145	2250	41.09	540	34.15	35.50	5.90	4298	11.74	9.07	9.50	9.07	7.88
MF255 Diesel	1189	Die.	7130	1160	4	3.600x5.000	203	2000	50.69	540	45.55	43.72	5.28	5257	15.88	13.32	13.44	13.36	12.24
255 12-Speed	1250	Die.	7310	895	4	3.875x5.000	236	2000	52.68	540	48.37	44.75	7.89	5591	16.92	12.70	13.34	12.82	11.03
MF265 Diesel	1188	Die.	8200	1815	4	3.875x5.000	236	2000	60.73	540	54.76	51.87	5.23	6248	15.88	13.44	13.52	13.51	12.16
MF275 Diesel	1193	Die.	9330	2720	4	3.975x5.000	248	2000	67.43	540	61.76	60.16	5.16	7292	14.18	12.51	13.04	13.22	11.63
MF285 Diesel	1171	Die.	11760	4110	4	4.500x5.000	318	2000	81.96	1000	81.96	70.53	7.77	8846	14.98	12.68	12.85	12.90	11.34
MF1085 Diesel	1133	Die.	14385	2845	4	4.500x5.000	318	2000	81.58	1000	81.58	70.76	5.58	10355	15.82	13.21	13.43	13.15	11.55
MF1105 Diesel	1132	Die.	16725	4405	6	3.875x5.000	354	2200	100.72	1000	96.43	86.26	4.36	7415	15.43	11.53	12.37	11.55	9.81
MF1135 Diesel	1135	Die.	18900	5350	6	3.875x5.000	354	2200	120.84	1000	118.47	106.52	4.56	13955	16.18	12.24	13.22	12.56	10.71
MF1150	1049	Die.	22625	4578	8	4.250x4.500	510.7	2200	135.60	1000	128.78	123.96	6.06	17260	15.20	12.50	13.49	13.37	11.31
MF1155 Diesel	1134	Die.	20460	5554	8	4.250x5.000	540	2200	140.97	1000	134.11	124.90	4.40	15630	15.66	12.77	13.15	13.00	11.45
MF1500	1086	Die.	20555	3355	8	4.500x4.500	573	3000	....	....	....	152.77	5.30	17295	....	....	12.99	12.49	10.90
MF1505 Diesel	1172	Die.	20970	3010	8	4.500x5.000	636	2800	174.46	1000	175.95	154.10	6.98	17226	14.55	11.41	12.27	11.43	9.54
MF1800	1087	Die.	21760	4430	8	4.500x5.000	636	2800	....	....	....	183.65	7.07	18432	....	....	13.27	13.49	11.93
MF1805 Diesel	1173	Die.	22790	4790	8	4.500x5.000	636	2800	192.65	1000	191.60	170.17	6.95	18781	14.77	12.14	12.76	12.41	10.77
2675, 8-Speed	1321	Die.	14280	1930	6	3.875x5.0	354	2500	100.84	1000	95.00	86.18	5.91	10226	15.00	11.14	11.48	11.57	10.01
2675, 24-Speed	1309	Die.	14465	2065	6	3.875x5.0	354	2500	103.29	1000	96.67	86.99	7.21	9674	15.43	11.56	11.76	11.49	9.95
2705, 8-Speed	1322	Die.	16800	4295	6	3.875x5.0	354	2500	121.00	1000	114.44	101.47	6.17	12588	16.84	11.22	12.54	11.30	9.45
2705, 24-Speed	1310	Die.	17490	4895	6	3.875x5.0	354	2500	122.20	1000	115.85	103.02	7.50	13085	16.65	11.22	12.74	11.27	9.23
2745 Diesel	1311	Die.	19490	4300	8	4.25x4.75	539	2600	143.40	1000	132.21	123.37	7.78	15386	15.40	10.62	11.96	11.13	9.39
MF2775	1278	Die.	20400	4210	8	4.63x4.75	640	2600	165.95	1000	149.86	143.70	5.72	17407	16.05	11.50	12.57	11.52	9.85
2805 24-Speed	1258	Die.	21170	5540	8	4.630x4.750	640	2500	194.62	1000	181.77	160.72	7.10	17369	16.29	11.33	12.21	11.14	9.27
Minneapolis-Moline																			
G955	1161	Die.	12060	None	6	4.375x5.000	451	1800	98.38	1000	98.82	83.40	5.44	8374	13.92	11.93	11.26	11.76	10.29
G1350	1069	Die.	20540	8490	6	4.750x5.500	585	2200	141.44	1000	128.10	125.29	5.70	15620	15.23	12.16	12.33	12.23	10.86
G1355 Diesel	1141	Die.	18070	974	6	4.750x5.500	585	2200	146.62	1000	146.62	128.95	7.89	14178	15.21	12.47	13.61	12.85	11.23
A4T-1600	1070	Die.	19850	None	6	4.750x5.500	585	2200	143.27	1000	125.38	129.48	6.77	18236	14.14	11.76	12.56	12.24	10.79
Oliver																			
1655	1042	Gas.	10850	3070	6	3.750x4.000	265	2200	70.27	994	70.27	58.48	6.46	8519	10.07	8.02	8.84	8.12	6.97
1655	1041	Die.	11100	2120	6	3.875x4.000	283	2200	70.57	994	70.57	61.90	4.14	9097	14.00	12.33	12.32	12.54	11.28
1755	1056	Gas.	13070	3582	6	3.875x4.000	283	2400	86.98	984	86.98	74.93	8.23	10407	11.37	8.63	9.45	8.34	7.69
1755	1057	Die.	13250	3560	6	3.875x4.375	310	2400	86.93	984	86.93	76.38	4.05	10549	13.00	11.65	11.14	12.05	9.15

1855	1040	Die.	14800	3662	6	3.875x4.375	310	2400	98.60	984	98.60	84.30	4.65	11487	15.84	12.56	13.30	12.23	10.48
1955	1065	Die.	16220	4976	6	3.875x4.375	310	2400	108.16	984	108.16	92.85	8.24	12639	15.78	12.85	12.99	12.62	11.13
2155 .i..............	1069	Die.	20640	8490	6	4.750x5.500	585	2200	141.44	1000	128.10	125.29	5.70	15620	15.23	12.16	12.33	12.23	10.86
2255 Diesel	1140	Die.	17990	1583	8	4.500x4.500	573	2600	146.72	1000	147.65	126.13	5.70	14770	15.66	12.47	13.43	12.95	11.25
2655	1070	Die.	19850	None	6	4.750x5.500	585	2200	143.27	1000	125.38	129.48	6.77	18236	14.14	11.76	12.56	12.24	10.79
Same																			
Panter 4WD Diesel	1185	Die.	12000	2772	5	3.860x4.720	276	2200	80.02	1000	79.10	66.67	5.75	10389	14.79	12.74	12.40	12.30	10.00
Tiger 1000	1268	Die.	11620	2500	5	4.13x4.72	317	2200	90.45	1000	89.42	78.84	6.35	9116	15.48	13.22	12.41	13.08	11.26
Buffalo 4WD Diesel	1186	Die.	13795	3708	6	4.130x4.720	380	2200	104.94	1000	104.94	88.24	4.24	10941	15.23	12.78	12.47	12.44	10.76
Satoh																			
S650G	1106	Gas.	3640	1400	4	2.677x2.677	60.2	2800	22.03	1000†	20.37	18.78	3.96	2794	9.91	8.38	8.55	9.03	7.88
Steiger																			
Wildcat III ST-210																			
&RC-210	1237	Die.	22260	None	8	4.500x5.000	636	2800	....	....	....	171.44	5.64	21052	....	....	12.71	12.58	10.82
Bearcat	1079	Die.	22650	2086	8	4.500x5.000	636	2800	....	....	....	165.64	5.76	21287	....	....	12.91	12.46	11.04
Bearcat II	1162	Die.	23020	1585	8	4.500x5.000	636	2800	....	....	....	180.69	6.57	22622	....	....	12.79	12.37	10.92
Bearcat III ST-220	1246	Die.	29380	None	6	5.500x6.000	855	2100	....	....	....	175.58	4.84	26936	....	....	13.24	12.60	11.04
Bearcat III PT225	1272	Die.	30825	None	6	4.75x6.00	638	2200	(1)	....	....	180.86	6.33	29749	....	....	12.02	10.80	9.29
Bearcat III 225 without PTO												187.59	5.58	29953	....	....	12.81	11.52	10.07
Cougar II	1170	Die.	27995	1305	6	4.750x6.000	638	2200	....	....	....	228.15	4.44	26432	....	....	13.15	12.77	11.59
Cougar III ST-250	1239	Die.	29800	None	6	4.750x6.000	638	2200	....	....	....	210.35	6.38	26612	....	....	12.74	11.90	10.36
Cougar III ST-251	1233	Die.	30840	None	6	5.500x6.000	855	2100	....	....	....	205.82	7.98	26880	....	....	14.74	13.89	11.60
Cougar III PT270	1273	Die.	32210	1495	6	4.75x6.00	638	2200	(1)	....	....	219.39	6.29	30122	....	....	12.73	11.81	10.23
Cougar III 270 without PTO												224.54	4.89	29950	....	....	12.97	12.45	10.76
Cougar III ST-270	1238	Die.	29930	None	6	4.750x6.000	638	2200	....	....	....	228.96	6.38	25731	....	....	13.32	12.62	10.96
Panther III ST-310	1235	Die.	30850	None	6	5.500x6.000	855	2100	....	....	....	261.78	7.90	26757	....	....	13.95	13.09	11.02
Panther III ST-325	1236	Die.	31080	None	6	5.400x6.500	893	2100	....	....	....	281.94	7.93	28189	....	....	14.82	14.19	12.64
Panther III PT350	1274	Die.	34000	2855	8	5.5x4.75	903	2600	(1)	....	....	305.48	6.51	[illegible]	....	....	14.91	13.75	11.32
Panther III 350 without PTO												311.64	7.38	[illegible]	....	....	15.03	Not Tested	
Tiger II	1169	Die.	22930	2330	8	[illegible]	903	2600	....	....	....	270.21	6.73	28097	....	....	13.88	12.70	10.61
Tiger III ST450	1282	Die.	47370	4645	6	[illegible]	1150	2109	....	....	....	385.74	5.23	42715	....	....	15.57	Not Tested	

(1) Equipped with controlled hydrostatic pto with 105 output horsepower at 1000 rpm.

Versatile																			
555 Diesel	1331	Die.	25980	6330	8	4.625x4.125	555	2550	184.35	1000	184.35	157.30	4.05	[illegible]	16.33	11.15	12.96	11.17	8.83
875 Diesel	1332	Die.	29480	4160	6	5.5x6.0	855	1750	247.16	1000	247.16	242.03	6.36	26795	16.06	12.02	14.35	12.53	10.34
White																			
2-50 Field Boss	1231	Die.	6880	2325	3	3.940x4.330	158	2500	47.02	540	43.94	41.88	4.80	5640	15.80	13.03	13.26	13.49	11.97
2-60 Field Boss	1232	Die.	8990	3830	4	3.940x4.330	211	2400	63.22	540	54.35	54.78	5.07	7352	17.63	13.82	14.40	13.87	11.93
2-70 Diesel	1212	Die.	9630	1000	6	3.875x4.000	283	[illegible]	70.71	1000	70.71	59.47	6.40	7550	14.56	12.28	11.92	12.13	10.72
2-85 Diesel	1213	Die.	12280	580	6	3.875x5.000	354	2200	85.54	1000	85.54	71.93	8.13	9309	[illegible]	11.72	12.24	11.74	9.71
2-105 Field Boss	1181	Die.	11810	None	6	3.875x5.000	354	2200	105.61	1007	105.61	90.81	6.34	9212	15.76	12.02	12.89	11.95	10.00
2-135	1275	Die.	16360	2225	6	4.56x4.87	478	2200	137.64	1000	138.03	[illegible]	8.93	11907	14.91	11.38	12.31	11.42	9.73
2-150 Field Boss	1182	Die.	16940	None	6	4.750x5.500	585	2200	147.49	1007	147.49	127.49	5.63	15059	14.46	11.90	12.07	12.14	10.63
4-150 Field Boss	1159	Die.	16960	None	8	4.500x5.000	636	2800	151.87	1000	152.45	133.34	6.34	16925	15.09	11.45	12.46	11.34	9.21
2-155	1276	Die.	16650	None	6	4.56x4.87	478	2200	157.73	1000	162.37	139.68	9.04	14512	15.38	11.91	12.69	11.53	9.97
2-180	1287	Die.	18280	None	8	4.5x5.0	636	2800	181.89	1000	181.89	163.64	6.50	15499	14.38	11.86	12.85	12.48	10.56
4-180 Field Boss	1184	Die.	20600	None	8	4.500x5.000	636	2800	181.07	1000	182.30	156.54	4.59	20469	14.19	11.47	11.79	11.56	9.98
4-210 Field Boss	1318	Die.	23735	None	8	4.5x5.0	636	2800	182.44	1000	182.44	162.25	5.89	22934	14.26	11.53	12.34	12.10	10.25
Yanmar																			
YM240 Diesel	1199	Die.	3305	1355	2	3.543x3.543	70	2400	19.76	540	18.75	16.60	4.86	2442	15.05	12.64	12.35	11.95	10.37

†See complete test for data @ 540 rpm.

NOTE

ONLY THE FOLLOWING PAGES OF THIS PUBLICATION

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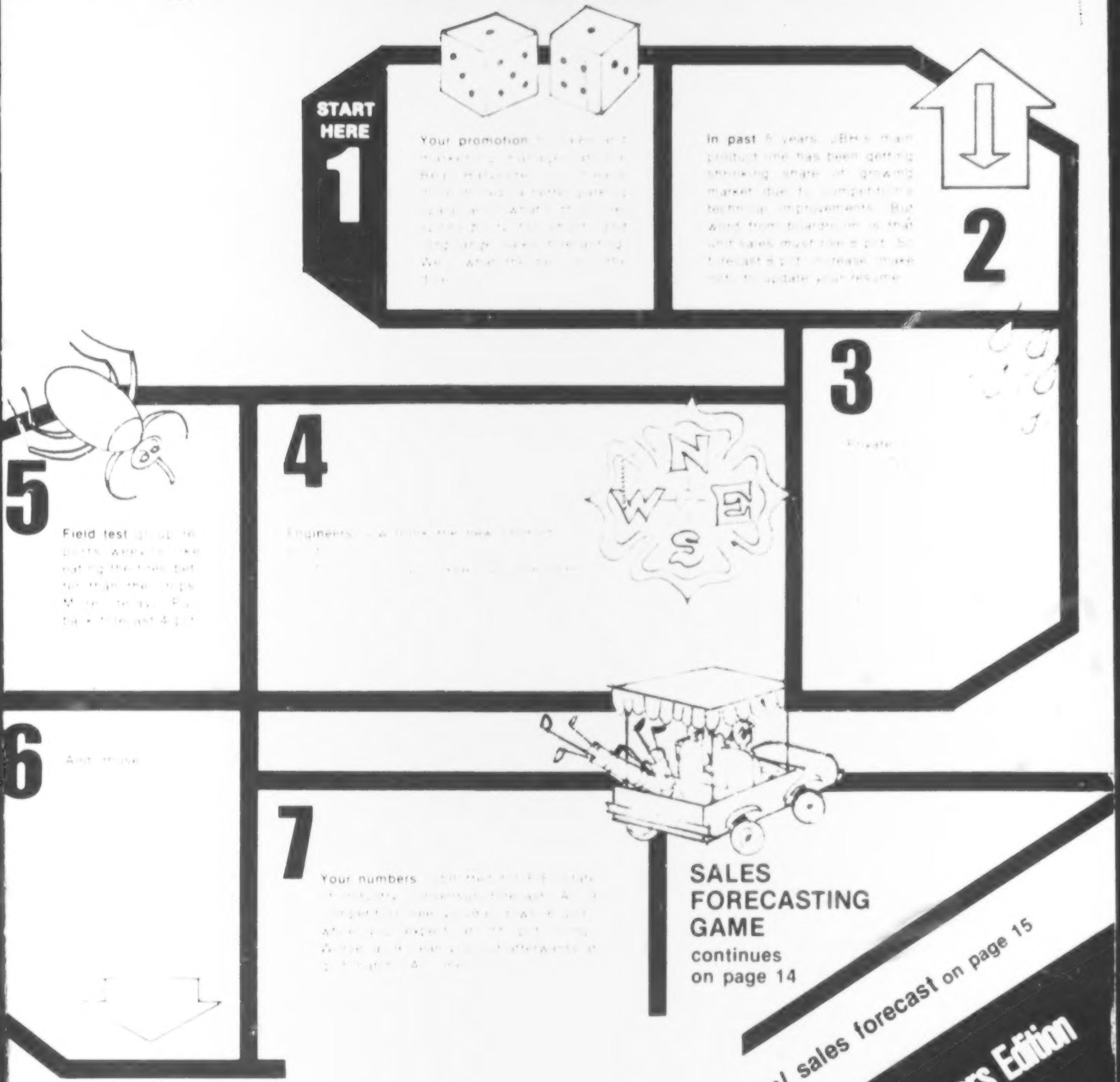
February 7, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

Implement&Tractor



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Private [illegible]

Engineers [illegible]

Field test [illegible]

And those [illegible]

Your numbers [illegible]

SALES FORECASTING GAME

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In the I&T Manufacturers Edition
Powder Metallurgy Update

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February 7, 1980 • Vol. 95 • No. 4

Implement&Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

FORECASTING—FOR FUN AND FOR REAL

14: **The Continuing (Indeed, the Interminable) Sales Forecasting Game.** All you need to play are last year's sales figures, a pair of dice, copies of every financial and agricultural bulletin and journal from *Alabama Apple Advocate* and *Barron's* to the *Wall Street Journal* and *Zucchini Digest*, a set of well-tuned bunions and nerves of steel.

15: **Marketing & Management Conference: The Official FIEI 1980 Sales Forecast.** The Farm & Industrial Equipment Institute's Marketing & Management Conference is looking for a fairly hefty 8 per cent dollar increase in farm equipment sales in 1980, but most if not all of the increase will be eaten up by inflation. Also in this report, a glance at 1981.

20: **What Needs Are Unmet In Today's Tillage Equipment?** The FIEI Tillage Equipment Council and a panel of farmers and dealers air their views.

28: **Signs Point Way to Non-Farm Sales.** Or, "How Much Is That Nut (Screw, Bolt, Etc.) in the Window?" Ed Szczepanik found that all he had to do to capture more suburbanite sales was to let them know he has what they need.

42: **Here Come More Tractors from Japan.** In this latest wave are offerings from Yanmar, Hinomoto, White and Satoh.

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RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-Oct., 1978				Cumulative for Jan.-Oct., 1979			
	Oct., 1978		Oct., 1979		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	272	90	296	66	2,463	48	2,511	764	2,440	38	2,478	573
Alaska	.....	11	5	6	16	.....	16	46	19	1	20	36
Arizona	106	83	125	86	626	55	681	578	596	99	695	601
Arkansas	419	97	554	85	3,098	271	3,369	816	3,341	241	3,582	628
California	627	467	644	458	3,706	269	3,975	3,204	4,066	328	4,394	3,349
Colorado	172	87	169	103	869	85	954	691	947	164	1,111	644
Connecticut	26	41	15	40	170	3	173	304	163	2	165	244
Delaware	17	5	29	2	152	13	165	75	203	19	222	47
Florida	374	190	318	181	2,064	86	2,150	1,458	1,995	79	2,074	1,537
Georgia	460	143	417	95	3,683	53	3,736	871	3,366	39	3,405	802
Hawaii	5	19	7	11	66	4	70	85	49	4	53	95
Idaho	233	33	202	21	1,028	123	1,151	240	941	158	1,099	185
Illinois	1,249	256	1,161	213	6,767	677	7,444	1,835	6,035	794	6,829	1,550
Indiana	659	155	694	95	4,381	407	4,788	1,176	3,749	465	4,214	820
Iowa	1,536	78	1,388	56	7,784	415	8,199	512	7,996	692	8,688	426
Kansas	519	29	570	50	3,114	437	3,551	342	3,751	570	4,321	356
Kentucky	506	105	489	103	4,238	89	4,327	979	4,027	98	4,125	752
Louisiana	364	167	374	94	2,260	204	2,464	1,190	2,250	165	2,415	787
Maine	36	18	38	18	223	1	224	139	209	2	211	128
Maryland	97	94	104	68	685	22	707	607	726	38	764	476
Massachusetts	9	83	13	47	118	.....	118	444	126	.....	126	324
Michigan	428	253	405	254	2,776	219	2,995	1,366	2,555	243	2,798	1,356
Minnesota	1,227	107	945	87	5,662	490	6,152	568	5,435	868	6,303	678
Mississippi	434	78	381	46	3,119	178	3,297	710	3,024	141	3,165	551
Missouri	691	135	735	110	4,332	218	4,550	1,027	4,824	256	5,080	872
Montana	173	32	127	20	711	359	1,070	193	818	409	1,227	166
Nebraska	588	41	539	38	3,487	173	3,660	300	3,915	296	4,211	266
Nevada	11	32	15	42	76	1	77	199	115	9	124	200
New Hampshire	16	16	36	14	121	.....	121	135	132	1	133	106
New Jersey	43	132	32	97	325	6	331	706	275	8	283	649
New Mexico	38	28	41	58	371	22	393	336	415	23	438	310
New York	367	151	402	147	2,422	88	2,510	1,326	2,388	110	2,498	1,044
North Carolina	680	113	538	81	3,911	48	3,959	1,012	3,600	68	3,668	833
North Dakota	519	37	381	39	2,293	725	3,018	255	2,201	1,028	3,229	224
Ohio	773	270	665	196	4,957	297	5,254	1,843	4,005	364	4,369	1,596
Oklahoma	322	111	418	98	2,527	224	2,751	788	3,105	418	3,523	689
Oregon	209	78	182	64	1,205	73	1,278	544	1,144	94	1,238	491
Pennsylvania	349	271	283	200	2,439	27	2,466	1,759	2,126	37	2,163	1,358
Rhode Island	5	9	4	9	25	.....	25	57	23	.....	23	40
South Carolina	225	61	225	48	1,631	26	1,657	527	1,654	37	1,691	439
South Dakota	392	21	325	19	2,218	240	2,458	167	2,124	315	2,439	169
Tennessee	385	109	379	84	3,940	72	4,012	1,009	3,571	63	3,634	839
Texas	1,355	510	1,429	606	7,806	350	8,156	3,875	9,206	562	9,768	3,970
Utah	72	62	78	52	548	15	563	432	624	17	641	422
Vermont	55	18	70	8	338	3	341	83	360	8	368	68
Virginia	339	139	326	80	2,261	10	2,271	971	2,272	17	2,289	647
Washington	253	125	206	109	1,386	176	1,562	900	1,472	180	1,652	780
West Virginia	62	46	81	34	545	.....	545	331	554	.....	554	243
Wisconsin	779	76	697	94	4,716	138	4,854	696	5,108	229	5,337	675
Wyoming	58	33	50	30	334	21	355	198	381	37	418	225
U.S. Government	2	73	5	14	44	3	47	747	130	.....	130	534
Miscellaneous‡	1	157	1	142	85	3	88	1,244	44	4	48	1,461
TOTAL	18,537	5,575	17,613	4,818	114,122	7,467	121,589	40,680	114,595	9,838	124,433	36,262

Data released December 26, 1979, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; Hy-Dynamics; International Harvester; JCB Excavators; K-D Mfg.; Long; Massey-Ferguson; Pettibone; R. M. Wade (Satoh); Steiger; Versatile; White; and Wood & Copeland.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales that cannot be classified by state or as U.S. Government.

FIEI Marketing & Management Conference:

PREDICTING SALES IN 1980

■FORECASTING farm equipment sales falls somewhere between an inexact science and a guessing game.

That agriculture is, like few other businesses, susceptible to many and varied forces was driven home again very early in the year when the U.S. embargo of grain sales to the Soviet Union took some of the bloom off many rosy predictions.

The consensus sales forecast issued by the Farm & Industrial Equipment Institute at its semiannual Marketing & Management Conference may seldom or never be completely on the money, and it often proves to have been quite far afield. Even so, the forecast can hardly fail to present a much more accurate picture of the unfolding year than any single member company could construct on its own.

For instance, for 1980, in sales of farm tractors of 30 horsepower and under, the median forecast is a 1.7 per cent rise. The members whose predictions ranged far out on either side of this—the one who foresaw a sales decline of 15 per cent and the one who looks for a rise of more than 20 per cent—may in fact hold to their positions, but they certainly will want to think twice about them.

Probably nearly everybody came away from the Jan. 20-21 Marketing & Management Conference in Rancho Mirage, Calif., with his optimism, pessimism, or equanimity slightly modified.

Good news, bad news

In making their predictions, members of the FIEI Farm Equipment Div. decided for themselves what would be the major forces bearing upon the farm economy in 1980. As it turned out, looking at all the principal factors cited, for nearly every positive force mentioned there was a strong negative force lined up against it.

- Bumper crops at respectable prices were foreseen by a number of prognosticators. This should benefit equipment sales. *But*, at the same time, many members predicted a decline in realized net farm income.
- High export demand was seen as likely. *But*, political conflicts in importing countries could cause trouble for exporters.
- A "pent-up demand" for equipment was perceived. *But*, the high interest rates widely predicted will restrain demand.
- Off-farm cash receipts are likely to increase, members said. *But*, they added, so are their own operating expenses.
- There may be some election-year government moves to stimulate sales, it was thought; *but*, if there *are* any such actions, they will be taken in the framework of an economy which many manufacturers view as uncertain.

Members, generally, said they were looking forward to higher commodity prices (remember, the forecasts were made in advance of the conference, before the grain embargo); and a significant number of them said they perceived a desire among farmers to update equipment to meet changing tillage requirements due to the rising cost of fuel.

All in all, positive factors slightly overbalanced the negatives, producing a median forecast of an 8 per cent rise in total dollar value of 1980 farm equipment retail sales—"hardly enough to cover inflation," said H. J. Head (Ford), who reported the forecast.

1980 outlook

Among Head's other remarks:

"American agriculture enters the 80s with greater opportunities on

(*More*...)

1980 FARM EQUIPMENT SALES FORECAST

(United States Retail Sales)

Product	2nd 1979 Forecast	1979 Sales (Projected)	1980 Forecast	Per cent Change*
Farm Tractors				
30 hp and under	**	41,000	41,700	+1.7
30-99 hp	**	73,900	71,800	-2.8
100 hp and over	87,500	85,500	86,000	+0.6
4-Wheel Drive	9,900	11,000	11,800	+7.3
Total Farm Tractors	179,900	197,500	195,000	-1.3
S-P Combines	31,350	31,500	31,500	0.0
Cornheads	21,900	21,000	21,000	0.0
Moldboard Plows	33,300	31,900	31,500	-1.0
Disk Harrows	58,000	58,350	58,350	0.0
Field Cultivators	19,300	19,800	20,600	+4.0
Chisel Plows	16,900	17,000	18,000	+6.0
Balers (under 200 lbs.)	21,000	18,800	17,600	-6.1
Balers (200 lbs. and over)	18,500	21,000	22,500	+7.0
Forage Harvesters	12,550	13,250	13,250	0.0
Mower-Conditioners	25,500	25,000	25,000	0.0
Hay Stackers	1,830	1,490	1,075	-28.0
Stack Movers	1,700	1,780	1,300	-27.0
Windrowers/Swathers	8,800	8,400	8,400	0.0
Grinder-Mixers	11,000	12,600	11,700	-7.4
Manure Spreaders***	19,050	19,500	19,500	0.0
Cotton Strippers	1,450	1,750	1,600	-8.6

*Percentage figures are given as medians—the approximate mid-point in the range of estimates.

**Combined as tractors under 100 hp in this forecast.

***Box-type only.

the horizon than at any time since the expansion era immediately following the Korean War.

"Members see some difficult days ahead...but they look forward to increased exports as U.S. farm products become an even greater value on world markets...and they see great challenges to increase productivity and create new breakthroughs in technology to aid American agriculture in its continuing battle to ease world hunger.

"The U.S. agricultural economy, strong throughout most of 1979, is expected to remain vigorous this year.

"A year ago...our group predicted sales of farm tractors would increase by about one per cent to 175,600 units in 1979. We missed by about 9 per cent on the low side, based on a median November estimate of 192,500.

"Even though we underestimated a strong market, we might well merit a passing grade from a learned doctor at Purdue U., Gary Krutz, who published an article a year ago on how virtually impossible it is to predict farm tractor sales. While net income of farmers is the most reliable indicator, he wrote, it cannot be depended upon. The reason: farmers are impulse buyers. When it's time to buy, if they have the money, they might buy. But then again, they might not. All things considered, I think we've done pretty well in predicting, or attempting to predict, over the years."

Besides registering their predictions for the new year, members were invited to stick their necks out a little farther and try their luck at 1981. The following figures indicate median 1981 sales forecasts as a per cent change, plus or minus, from sales expected for 1980.

Product	Pct. Change, 1981 from 1980
Farm Tractors	
Under 30 hp	**+3.0**
30-100 hp	**0.0**
100 hp and over	**+2.0**
4-Wheel Drive	**+6.4**
All tractors	**+1.0**
S-P Combines	**0.0**
Moldboard Plows	**0.0**
Disk Harrows	**0.0**
Balers (large)	**+3.0**

Inventories

"Members were asked to comment on current inventory levels of the products they manufacture... and the results show a preponderance of opinion that inventory levels are about right—with the exception of four-wheel-drive tractors, where most seem to think inventories are too low, and in combines, where at least three makers think they're too high."

Marketing, R&D

Members were polled on their intentions to spend on advertising, sales promotion and research and development in 1980, and the median projections were: advertising, up 9.5 per cent, due to inflation, increased media costs, increased co-op advertising, and production catching up to markets; sales promotion, up 7.5 per cent and R&D, up 9.3 per cent due to inflation and a more competitive market. ☐

H. J. Head, general operations manager for Ford Tractor and Implement Operations in North America, delivered the report of the group's consensus forecast.

1980 AGRI-EQUIPMENT SALES FORECAST

United States

Product	Per cent Change*
Portable Farm Augers/Elevators	+5.0
Crop Dryers (bin types)	+1.0
Crop Dryers (batch, continuous-flow types)	+5.0
Farmstead Equipment (dairy, beef types)	+10.0
Farmstead Equipment (hog types)	0.0
Grain Bins	0.0
Milking Machines	+9.0
Chemical Application Equipment	+9.5
Dollar Volume Outlook	+6.0

*Percentage figures are given as medians—the approximate mid-point in the range of estimates.

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-Oct., 1978 and 1979 (1)

(In Units)

							Windrowers Self-Propelled							
	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Power Units		Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979
Alabama	477	439	151	99	366	244	1	1	1	1	163	196	59	54
Alaska	.....	3	.....	.....	6	6	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	46	30	9	5	32	41	67	57	72	64	6	4	10	15
Arkansas	973	1,008	6	11	499	414	2	2	1	1	57	52	15	22
California	237	228	63	58	202	233	288	275	307	302	4	13	62	69
Colorado	239	290	112	139	410	495	249	278	248	285	409	61	151	178
Connecticut	1	2	2	1	74	65	1	.....	1	.....	1	2	35	64
Delaware	41	53	35	34	34	18	3	.....	3	.....	2	10	13	13
Florida	148	130	88	69	133	102	.....	2	.....	2	60	59	31	23
Georgia	650	672	519	478	356	232	5	1	5	1	396	468	134	126
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	.....
Idaho	347	354	12	10	504	485	290	348	299	361	15	35	56	67
Illinois	3,265	3,031	3,094	3,110	402	389	30	15	30	15	585	597	322	328
Indiana	1,820	1,720	1,783	1,766	479	409	13	12	13	12	496	537	226	224
Iowa	3,282	3,097	3,441	3,554	475	451	254	259	261	255	1,471	1,829	884	866
Kansas	1,465	1,661	354	364	419	491	334	394	342	406	233	306	253	326
Kentucky	448	517	368	365	646	447	4	3	4	4	247	287	220	206
Louisiana	605	615	8	1	173	154	1	.....	1	.....	12	13	24	19
Maine	8	2	.....	.....	89	86	.....	3	.....	3	.....	1	29	59
Maryland	144	139	140	147	160	131	12	8	13	7	40	46	80	103
Massachusetts	.....	.....	1	.....	56	56	1	1	1	.....	3	1	29	30
Michigan	480	499	419	448	567	468	69	79	70	83	228	238	408	449
Minnesota	1,898	1,784	1,582	1,592	1,064	941	833	743	883	766	567	839	1,020	1,092
Mississippi	720	816	19	8	254	199	.....	.....	.....	.....	58	59	67	72
Missouri	1,393	1,475	767	821	730	665	90	82	93	84	448	581	183	197
Montana	422	369	1	5	452	396	557	487	611	525	49	67	63	46
Nebraska	1,589	1,609	1,441	1,507	268	251	445	499	462	505	390	558	395	452
Nevada	7	3	.....	.....	51	54	64	74	70	78	1	1	7	6
New Hampshire	.....	.....	.....	.....	52	57	1	1	1	1	.....	2	25	34
New Jersey	54	41	24	13	75	62	3	.....	3	.....	11	11	34	22
New Mexico	20	29	9	12	175	166	96	95	94	94	12	18	8	11
New York	129	136	144	162	853	786	81	72	83	72	152	115	788	917
North Carolina	501	581	470	478	547	305	2	3	2	3	210	230	135	122
North Dakota	1,099	1,264	52	58	143	91	1,041	897	1,108	965	97	167	137	137
Ohio	1,429	1,418	1,191	1,276	873	685	17	14	17	14	434	475	288	316
Oklahoma	417	553	18	11	704	890	142	163	148	168	98	139	37	56
Oregon	241	203	10	6	372	317	332	244	350	250	13	30	83	72
Pennsylvania	224	238	243	232	1,085	932	83	87	82	88	265	298	597	666
Rhode Island	.....	.....	.....	.....	6	6	.....	.....	.....	.....	.....	1	7	1
South Carolina	303	329	181	176	171	100	.....	.....	.....	.....	92	113	40	35
South Dakota	650	636	420	441	265	177	804	763	844	825	246	363	387	442
Tennessee	571	615	220	193	790	593	2	.....	2	.....	198	241	207	204
Texas	837	919	263	265	1,286	1,395	92	112	98	123	183	220	60	82
Utah	46	40	4	8	324	317	149	146	152	148	51	69	90	94
Vermont	.....	.....	2	.....	124	128	2	1	2	1	2	2	118	166
Virginia	178	214	151	189	585	468	9	7	9	7	116	141	258	223
Washington	311	365	18	66	357	340	184	207	187	219	17	19	102	90
West Virginia	3	3	4	4	364	259	.....	.....	.....	.....	24	31	47	49
Wisconsin	474	469	520	526	1,990	1,933	360	385	362	389	447	565	2,053	2,140
Wyoming	46	47	9	13	219	203	182	190	187	200	16	22	34	45
U.S. Government	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....
TOTAL	28,242	28,647	18,366	18,721	20,261	18,133	7,196	7,010	7,502	7,327	8,258	10,136	10,312	11,032

Data released December 26, 1979, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.

(4) Sales reported as miscellaneous are retail sales that cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types		Manure Spreaders Conveyor-Type		
1978	1979	1978	1979	
281	231	19	16	Alabama
1	1	1	1	Alaska
3	6	7	8	Arizona
496	565	91	106	Arkansas
51	47	62	73	California
118	164	39	65	Colorado
89	89	73	71	Connecticut
29	17	51	66	Delaware
126	108	22	28	Florida
327	265	30	46	Georgia
.....	1	.....	2	Hawaii
134	117	128	109	Idaho
756	746	989	855	Illinois
699	685	691	650	Indiana
,464	1,441	2,043	2,179	Iowa
682	976	196	238	Kansas
,175	1,177	289	289	Kentucky
114	121	20	24	Louisiana
106	119	106	111	Maine
166	169	219	210	Maryland
77	80	58	64	Massachusetts
895	749	708	712	Michigan
,259	1,428	1,493	1,710	Minnesota
191	188	25	31	Mississippi
,564	1,715	353	411	Missouri
136	121	53	47	Montana
437	597	409	502	Nebraska
3	12	3	5	Nevada
81	68	55	48	New Hampshire
97	74	48	54	New Jersey
37	33	3	6	New Mexico
,182	1,223	1,380	1,344	New York
472	362	158	149	North Carolina
128	168	175	103	North Dakota
,218	1,072	906	923	Ohio
687	934	28	30	Oklahoma
238	184	88	108	Oregon
,277	1,182	1,175	1,214	Pennsylvania
8	6	3	1	Rhode Island
168	132	27	29	South Carolina
120	145	273	333	South Dakota
846	915	149	167	Tennessee
,285	1,494	119	142	Texas
185	178	130	89	Utah
240	246	228	246	Vermont
647	726	221	224	Virginia
199	153	102	130	Washington
220	235	80	84	West Virginia
,067	3,054	2,400	2,585	Wisconsin
146	65	45	46	Wyoming
.....	.....	.....	.....	U.S. Government
.....	.....	1	1	Miscellaneous
,911	24,584	15,972	16,687	TOTAL

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

BILL ENLOW TRACTOR SALES
Tulsa, Okla.
(December 8, 1979)

ALLIS-CHALMERS TRACTORS

D-21 diesel, cab, 1965 (Good)	2600*

CASE TRACTORS

VAC, 1951 (Fair)	350
800 diesel, 1957 (Fair)	925
630 diesel, 1963 (Good)	2000
930 LP, 1967 (Fair)	2050
930 diesel, 1968 (Good)	3800
580 diesel, backhoe, 1967 (Good)	5000
580B diesel, backhoe, 1973 (Fair)	6400

DEUTZ TRACTOR

D906 diesel, (Good)	3750

FERGUSON TRACTORS

20, 1949 (Fair)	1000
40, 1954 (Fair)	1450*

FORD TRACTORS

9N, 1940 (Good)	950
9N, 1943 (Fair)	875
9N, 1944 (Good)	1000
8N, 1947 (Fair)	1175
8N, 1947 (Fair)	1150
8N, 1948 (Good)	1275
8N, 1948 (Good)	1340
8N, 1948 (Good)	1400
8N, 1949 (Fair)	1075
8N, 1950 (Fair)	1250
8N, 1950 (Good)	1325
8N, 1950 (Good)	1355
8N, 1951 (Good)	1450
8N, 1951 (Fair)	1200
8N, 1952 (Good)	1725
8N, 1952 (Good)	1325
8N, 1952 (Good)	1300
8N, 1952 (Good)	1575
NAA, 1953 (Fair)	1700*
NAA, 1953 (Good)	1775
640, 1954 (Good)	2000
650, 1955 (Fair)	1650
650, 1956 (Good)	2436
601, 1958 (Good)	2[illegible]
641, 1958 (Good)	2[illegible]
800, 1955 (Fair)	2025
850, 1956 (Rough)	1675
801, 1959 (Rough)	1750
Dexta, 1961 (Good)	1300
Dexta diesel, 1962 (Good)	1800
2000, backhoe, 1963 (Good)	3000
3000 diesel, 1966 (Fair)	3150
3000 diesel, 1967 (Good)	3600*
4000, 1962 (Fair)	1500*
4000 diesel, 1965 (Rough)	2200
4000 diesel, 1970 (Good)	3600*
4000 diesel, 1971 (Good)	3650*
4000 diesel, 1972 (Good)	4100*
5000 diesel, 1972 (Good)	5450
6000 diesel, 1967 (Fair)	1250
3400 diesel, 1965 (Fair)	3000
4400 diesel backhoe, 1971 (Fair)	4500*

INTERNATIONAL HARVESTER TRACTORS

Cub, 1950 (Good)	1650
Cub, 1953 (Good)	1750
Cub, 1958 (Fair)	1000*
154 Cub, 1968 (Good)	2000*
154 Cub, 1968 (Fair)	1600
300, backhoe, 1958 (Fair)	1950
3414, backhoe, 1964 (Good)	3450*
TD-24 dozer, (Good)	5750
450, disk, 1957 (Good)	1500
460 LP, 1960 (Good)	900
806 diesel, 1966 (Good)	5700
806 diesel, 1967 (Good)	5300*

JOHN DEERE TRACTORS

B, 1950 (Fair)	200*
2010, 1961 (Fair)	1100*
2010, 1963 (Good)	1650*
2010 diesel, 1965 (Good)	2500
2010 diesel, 1965 (Rough)	1000*
3010 diesel, 1960 (Good)	3300*
2020 diesel, 1969 (Fair)	2650
3020 diesel, 1970 (Good)	5050
1520 diesel, 1974 (Good)	5250*

MASSEY-FERGUSON TRACTORS

MH 444, 1957 (Fair)	220
35, 1959 (Fair)	1750
35, 1961 (Good)	2100
35, 1962 (Good)	2000*
50, 1957 (Good)	1675*
50, 1959 (Good)	1800
50, ldr., 1960 (Fair)	1800*
50, 1961 (Fair)	1900*
65 diesel, 1960 (Fair)	2000*
65, 1961 (Rough)	1400*
65 diesel, 1961 (Fair)	2100*
65 diesel, 1962 (Fair)	2050
65 diesel, 1962 (Fair)	1950
65 diesel, 1962 (Good)	2350
65 diesel, 1963 (Good)	2200
65 diesel, 1964 (Good)	3050
65 diesel, 1964 (Good)	3025
135, 1965 (Fair)	2600
135, 1965 (Fair)	2450*
135, 1966 (Good)	2750
135 diesel, 1971 (Good)	3500*
135 diesel, 1972 (Good)	3700
135 diesel, 1974 (Good)	3875
165 diesel, 1965 (Rough)	2500
165, 1966 (Fair)	2750
165, 1967 (Good)	3575
165, 1967 (Good)	3400
165, 1968 (Good)	3650
165, 1969 (Good)	3550
165, 1969 (Good)	3750
175, 1968 (Fair)	3050
175, 1970 (Good)	4175
175, 1971 (Good)	4150
175, 1973 (Good)	4350*
180, 1967 (Fair)	3250*
202, ldr., 1964 (Fair)	1950*
202 diesel, ldr., 1968 (Good)	3650
203 diesel, 1968 (Fair)	2500*
235, 1975 (Good)	4100
235 diesel, 1975 (Good)	4250
230 diesel, (New)	6250
230 diesel, (New)	6100*
230 diesel, (New)	6350
245 diesel, (New)	6850*
245 diesel, (New)	6900*
245 diesel, (New)	7000*

MINNEAPOLIS-MOLINE TRACTOR

Vista 1000 diesel, 1967 (Fair)	2600*

OLIVER TRACTORS

Dozer, 1944 (Good)	1050
S-55 diesel, 1958 (Fair)	950*
1250 diesel, 1969 (Good)	4750*

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(December 11, 1979)

ALLIS-CHALMERS TRACTORS

5040 diesel, 1976 (Fair)	4000*
175 diesel, 1970 (Good)	5650
WD45, 1954 (Rough)	250*
WD45, 1954 (Fair)	400
ED40, (Good)	900
D17 diesel, 1965 (Good)	2700
D15 diesel, 1961 (Fair)	1100*
D15 diesel, 1961 (Good)	1550*
CA, 1955 (Fair)	450

CASE TRACTORS

1175 diesel, 1974 (Good)	9300*
930 diesel, cab, 1961 (Fair)	825
530 diesel, ldr., 1964 (Good)	2200
430, ldr., 1968 (Good)	3600*

DEUTZ TRACTOR

4505 diesel, 1970 (Fair)	1075

MASSEY-FERGUSON TRACTORS

1155 diesel, 1976 (Good)	7950
1150 diesel, 1971 (Fair)	4400*
1135 diesel, cab, 1977 (Excellent)	12,200*
1105 diesel, 1973 (Good)	8300
1100 diesel, 1967 (Good)	5000
285 diesel, 1976 (Good)	9000
265 diesel, 1975 (Good)	6650
255 diesel, 1975 (Good)	5300
235 diesel, 1976 (Good)	4300
235 diesel, 1975 (Good)	4100
235 diesel, 1975 (Fair)	3750
200 diesel, backhoe, 1967 (Good)	3600
180 diesel, 1968 (Fair)	3350
180 diesel, 1967 (Fair)	3100*
180 diesel, 1967 (Good)	3800
175 diesel, 1974 (Good)	4000
175 diesel, 1974 (Good)	4450
175 diesel, 1973 (Good)	4050
175 diesel, 1973 (Good)	3900
175 diesel, 1973 (Good)	4225
175 diesel, 1972 (Good)	4400

175 diesel, 1970 (Good)	3950
175 diesel, 1969 (Fair)	2825
3165 diesel, 1969 (Fair)	2100*
165 diesel, 1970 (Fair)	3300
165 diesel, 1967 (Good)	3800
165 diesel, 1966 (Fair)	3350
165 diesel, 1966 (Good)	3500
165 diesel, 1966 (Good)	3450
165 diesel, 1966 (Fair)	3125
150 diesel, 1969 (Good)	3400*
150 diesel, 1965 (Fair)	2800*
150 diesel, 1965 (Fair)	2800
150 diesel, 1965 (Good)	3500
135 diesel, 1973 (Fair)	2900
135 diesel, 1966 (Good)	3450
65 diesel, 1964 (Fair)	1375
65 diesel, 1963 (Good)	1950*
65, 1958 (Good)	1600
50, 1959 (Good)	2000
50, 1959 (Rough)	1350
40, 1956 (Good)	1800
35 diesel, 1963 (Good)	1850
35 diesel, 1961 (Excellent)	2200
35 diesel, 1961 (Fair)	1250
35 diesel, 1959 (Good)	1750
35, 1957 (Fair)	1450
35, 1957 (Fair)	1400
35, 1956 (Good)	1950
35, 1955 (Fair)	1200
35, 1955 (Fair)	1225
T030, 1952 (Good)	1050
T030, 1952 (Good)	1250*
T030, 1952 (Rough)	600

FORD-FERGUSON TRACTORS

9N, 1946 (Fair)	650
9N, 1946 (Fair)	750
9N, 1946 (Good)	1100
9N, 1944 (Fair)	750
9N, 1944 (Good)	800
9N, 1942 (Rough)	625*

FORD TRACTORS

8000 diesel, 1969 (Good)	4800
8000 diesel, 1968 (Rough)	2700
8000 diesel, 1968 (Good)	4700
7000 diesel, cab, air, 1973 (Good)	7300
5500 diesel, ldr., backhoe, 1970 (Good)	6300
5000 diesel, 1975 (Excellent)	6000*
5000 diesel, 1975 (Excellent)	5500
5000 diesel, 1972 (Good)	4750
5000 diesel, 1971 (Good)	4650
5000 diesel, 1970 (Excellent)	5500*
5000 diesel, 1969 (Good)	4350
5000 diesel, 1967 (Good)	4200
5000 diesel, 1966 (Fair)	3800
5000 diesel, 1965 (Good)	4000*
4500 diesel, ldr., backhoe, 1971 (Fair)	4500*
4500 diesel, ldr., backhoe, 1970 (Good)	5100
4500 diesel, ldr., backhoe, 1969 (Good)	4750
4410 diesel, 1968 (Rough)	1750*
4000 diesel, 1971 (Excellent)	4150
4000 diesel, 1969 (Excellent)	4750*
4000 diesel, 1967 (Good)	3100
4000 diesel, 1965 (Good)	3400
4000 diesel, 1963 (Rough)	1150*
4000, 1963 (Fair)	1575*
4000, Select-O-Speed, 1963 (Rough)	800
3400 diesel, 1971 (Rough)	1600*
3400 diesel, ldr., 1968 (Fair)	2150
3000, diesel, 1970 (Good)	3200
3000, 1968 (Good)	3100*
3000 diesel, 1968 (Fair)	2800*
3000 diesel, 1968 (Good)	3350
3000 diesel, 1966 (Fair)	2350
3000 diesel, 1965 (Good)	3000*
2000 diesel, 1963 (Rough)	1350
2000, 1967 (Fair)	1800*
2000, ldr., 1965 (Rough)	1450
971 diesel, Select-O-Speed, corn picker, 1978 (Rough)	900
871, Select-O-Speed, 1958 (Fair)	1100*
851 diesel, 1958 (Fair)	1200*
850, 1955 (Good)	1850
850, 1955 (Good)	2100*
950, 1955 (Excellent)	2525
841 diesel, 1958 (Good)	1900
841 diesel, 1958 (Good)	1800*
850, 1957 (Good)	1600*
641, LP, 1961 (Good)	2000*
641, 1959 (Good)	1950*
641, 1958 (Good)	2200
641, 1958 (Good)	2100*
640, 1955 (Good)	1550
621, 1960 (Good)	1950*
Dexta, 1961 (Excellent)	1600
Dexta, 1959 (Fair)	875
NAA 1954 (Excellent)	1900*
NAA, 1954 (Good)	1450*
Jub., 1953 (Good)	1400*
Jub., 1953 (Excellent)	1800*
Jub., 1953 (Good)	1600
Jub., 1953 (Fair)	1350
8N, 1952 (Fair)	1100
8N, 1950 (Good)	1325
8N, 1950 (Excellent)	1825
8N, 1950 (Good)	1400*
8N, 1950 (Rough)	675
8N, 1950 (Good)	1650*
8N, 1949 (Rough)	675*
8N, 1949 (Good)	1300
8N, 1949 (Good)	1450
8N, 1949 (Fair)	1075
8N, 1948 (Fair)	1050*
8N, 1948 (Good)	1200
8N, 1948 (Fair)	825

INTERNATIONAL HARVESTER TRACTORS

2400 diesel, ldr., 1971 (Fair)	2975
1468 diesel, 1972 (Excellent)	7000*
1206 diesel, 1967 (Good)	3850
1086 diesel, cab, air, 1976 (Excellent)	12,900*
986 diesel, 1977 (Excellent)	12,150
966 diesel, 1974 (Good)	9250
806, LP, 1965 (Fair)	2900
706 diesel, 1965 (Good)	3800*
674 diesel, 1975 (Good)	5700*
504, 1966 (Fair)	900*
454 diesel, 1971 (Good)	2450
2444 diesel, 1968 (Fair)	1600*
444 diesel, 1970 (Fair)	1050*
404, 1964 (Fair)	975
WD9, 1943 (Fair)	250
M, 1950 (Fair)	500*
M, 1945 (Fair)	475
Sup. C, 1952 (Good)	650
Sup. A, 1952 (Fair)	900
140, trencher, 1967 (Good)	2000*
Cub 154, Loboy, mo, 1968 (Fair)	1400*
Cub, 1964 (Good)	1250
Cub, mo., 1949 (Good)	1350*
Cub, cult., har., mo., 1948 (Fair)	1200

JOHN DEERE TRACTORS

5020 diesel, 1967 (Good)	6200*
4030 diesel, 1974 (Good)	8600*
4030 diesel, 1974 (Fair)	8000*
4020 diesel, 1968 (Good)	6100*
4010 diesel, 1962 (Fair)	4000*
3020 diesel, 1966 (Excellent)	5800
3010 diesel, 1961 (Rough)	1250
2840 diesel, 1977 (Good)	10,900
2640 diesel, 1977 (Good)	7200*
2630 diesel, 1975 (Good)	6500
2020 diesel, 1967 (Good)	4900
2020 diesel, trencher, bld., 1966 (Good)	4950
2010 diesel, 1964 (Fair)	1275
2010, LP, 1961 (Fair)	1100
1520 diesel, 1971 (Good)	3850
1020, 1966 (Good)	2800
1010, 1964 (Good)	1500
1010, 1962 (Good)	1600
1010 diesel, 1962 (Fair)	750
430, 1959 (Fair)	850

(More...)

Auctions

(continued)

410 diesel, ldr., backhoe, 1973 (Good)	8800
400 diesel, ldr., backhoe, 1970 (Good)	3600*
400 diesel, 1967 (Fair)	1275
330, 1959 (Good)	1200
70, 1954 (Good)	825
M, 1949 (Fair)	625

KUBOTA TRACTOR

B6000 diesel, cult., plt., plow, 1975 (Good)	2350

LEYLAND TRACTORS

270 diesel, 1973 (Good)	2500
154 diesel, 1974 (Good)	2600*

LONG TRACTORS

560 diesel, 1974 (Fair)	2850
560 diesel, 1974 (Good)	3250
384 diesel, 1973 (Fair)	1375*
384 diesel, 1973 (Good)	1900

OLIVER TRACTORS

1650 diesel, 1968 (Good)	3725
550 diesel, 1963 (Fair)	1225
500 diesel, 1963 (Fair)	500

YODER & FREY, INC.
Archbold, Ohio
(December 11, 1979)

ALLIS-CHALMERS TRACTORS

440 diesel, (Good)	12,000*
XT190 diesel, 1968 (Good)	7000
XT190, 1971 (Fair)	4700*
D21 diesel, 1964 (Good)	6100*
D15, 1962 (Fair)	1500*
WD45, 1954 (Rough)	650
WD, 1949 (Fair)	500
WD, (Rough)	250
CA, cult., 1953 (Good)	1100

CASE TRACTORS

1370 diesel, 1974 (Good)	14,900*
1370 diesel, 1973 (Good)	8850
1270, 1972 (Fair)	9000*
1170 diesel, 1972 (Good)	8600*
1170 diesel, 1970 (Fair)	5250*
1070, 1971 (Good)	8050
1070 diesel, 1970 (Good)	5600*
1030 diesel, 1967 (Fair)	3900*
1030 diesel, 1966 (Fair)	3500
930 diesel, 1968 (Fair)	3750
930 diesel, 1967 (Good)	4250*
930, 1966 (Good)	3100
930, 1965 (Fair)	3300*

DAVID BROWN TRACTORS

1210 diesel, 1973 (Good)	4550*
1200 diesel, ldr., 1976 (Good)	7275
1200 diesel, 1970 (Fair)	2825
885, (New)	6200*
885, 1978 (Excellent)	4250*
880, 1967 (Fair)	1075

FERGUSON TRACTORS

30, 1952 (Fair)	1090
20, 1949 (Fair)	925
20, 1948 (Fair)	670

JOHN DEERE TRACTORS

4520 diesel, 1972 (Good)	9400*
4430 diesel, 1977 (Excellent)	16,250
4020 diesel, 1971 (Good)	8975
4020 diesel, 1968 (Good)	7700*
4020 diesel, power shift, 1968 (Good)	7650
4020 diesel, 1968 (Good)	6900*
4020 diesel, 1967 (Good)	7250*
4020 diesel, 1967 (Fair)	6200
4020, 1965 (Good)	6500
4020 diesel, 1965 (Fair)	6400
4010 diesel, 1964 (Good)	6000
4010 diesel, 1963 (Good)	5000
4010, 1963 (Good)	4300
4010, 1961 (Fair)	3300
3020 diesel, 1968 (Fair)	5850
3020 diesel, 1967 (Good)	4900*
3020, 1966 (Good)	4250
3010 diesel, 1961 (Fair)	3200
2440, 1978 (Excellent)	9000
2030, ldr., 1975 (Fair)	7700*
2010, crawler, ldr., 1962 (Fair)	4600
2010, 1962 (Fair)	1675*
1020, 1970 (Good)	3500*
830, 1976 (Excellent)	5300
830 diesel, 1960 (Good)	2200*
730, 1960 (Good)	2000
730 diesel, 1960 (Rough)	1700*
720, 1957 (Fair)	1700*
720 diesel, 1957 (Fair)	1675
70, 1955 (Good)	1400
60, 1954 (Fair)	950*
60, 1954 (Fair)	825
A, 1951 (Good)	725
A, 1946 (Fair)	490

FORD TRACTORS

9600, 1976 (Good)	9500*
9600, 1974 (Good)	9100*
7000, 1975 (Excellent)	7600
6000 diesel, 1962 (Fair)	1450*
5000, 1973 (Good)	4000*
4000, 1965 (Fair)	2000*
4000, 1961 (Fair)	1700*
3000, 1973 (Good)	3500*
3000, ldr., 1971 (Good)	4300
1600, mo., (New)	4400*
860, 1958 (Good)	1975
960, ldr., 1958 (Fair)	1450*
850, 1956 (Fair)	1580
800, 1957 (Rough)	1250
Jub., bld., 1953 (Good)	1790
Jub., 1953 (Good)	1750
Jub., ldr., 1953 (Fair)	1650*
Jub., 1953 (Fair)	990
8N, 1952 (Rough)	1050
8N, 1951 (Fair)	900
8N, ldr., 1950 (Fair)	1175
8N, 1949 (Rough)	925
8N, 1948 (Fair)	1075
9N, 1946 (Fair)	890
9N, 1946 (Fair)	850
9N, 1945 (Fair)	825
9N, 1945 (Fair)	790

INTERNATIONAL HARVESTER TRACTORS

4100, 1971 (Good)	7500*
1566 diesel, 1975 (Good)	10,500*
1468 diesel, 1973 (Good)	8250*
1466, diesel, 1977 (Good)	11,000*
1466 diesel, 1976 (Good)	10,450
1456 diesel, 1971 (Good)	8000
1256 diesel, 1969 (Good)	7500
1256 diesel, 1969 (Good)	7450
1206 diesel, 1967 (Fair)	6000*
966 diesel, 1976 (Good)	9500
966 diesel, 1975 (Good)	10,000
886 diesel, (New)	17,000*
826, 1970 (Good)	7300*
826 diesel, duals, 1970 (Fair)	7250*
806 diesel, 1966 (Good)	5600
806 diesel, 1965 (Good)	5850
806, 1965 (Fair)	4875
756, 1971 (Good)	7250
706 diesel, 1965 (Rough)	2450
706, 1964 (Fair)	3300*
706, 1964 (Fair)	3000*
560, 1961 (Good)	2325

(More...)

Circle ([illegible]) on Reply Card

Auctions

(continued)

560, 1961 (Rough)	1800*
656, 1967 (Good)	4000
464, ldr., 1975 (Good)	5700
460, 1962 (Fair)	1875
460, 1961 (Good)	1900
460, 1961 (Fair)	1500*
454, 1971 (Rough)	3500*
B414, ldr., 1964 (Good)	1500
404, ldr., 1965 (Good)	3300
400, 1955 (Fair)	1225
100, 1956 (Good)	1150
MTA, 1954 (Good)	1275
Sup. MTA, 1954 (Fair)	1150*
Sup. M, 1954 (Good)	1100*
Sup. MTA, 1954 (Good)	1100*
M, 1951 (Good)	1000*
M, 1951 (Fair)	810*
Sup. M, 1951 (Fair)	775
M, ldr., 1949 (Rough)	750
Sup. H, 1953 (Good)	850*
H, 1950 (Fair)	525
Sup. A, cult., 1952 (Good)	1250*

MASSEY-FERGUSON TRACTORS

1155 diesel, 1974 (Excellent)	12,300
1150 diesel, 1972 (Good)	6700*
1150, 1971 (Fair)	6100*
1100, 1972 (Good)	5250
1100 diesel, 1970 (Good)	5800*
275, (New)	9100*
275, 1975 (Fair)	5250
285 diesel, 1978 (Excellent)	8500*
230, 1978 (Excellent)	5425
180 diesel, 1970 (Good)	4500*
180 diesel, 1968 (Rough)	3100
165, 1971 (Fair)	3750
165 diesel, ldr., 1970 (Good)	4600
165, 1970 (Good)	3500
165, 1969 (Good)	3550
Sup. 90 diesel, 1962 (Rough)	1100*
65 diesel, 1963 (Fair)	1600
65, 1962 (Good)	2350
65, 1961 (Good)	2325
40, ldr., 1970 (Good)	3700

MINNEAPOLIS-MOLINE TRACTORS

GVI diesel, 1964 (Fair)	1175
GVI LP, 1962 (Fair)	1300*
705 LP, 1965 (Fair)	1350*
602, 1963 (Fair)	2100*
445, 1960 (Fair)	950
335, 1961 (Rough)	900
Jet Star 3, 1961 (Fair)	750

OLIVER TRACTORS

2050 diesel, 1968 (Fair)	6000*
1800, 1963 (Good)	3100*
1800 diesel, (Fair)	2600
1650, 1967 (Good)	3400
1650, 1966 (Fair)	2600*
1600, 1965 (Fair)	1800*

WHITE TRACTORS

4-150 diesel, (Good)	15,100
2-150 diesel, 1975 (Excellent)	12,250

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

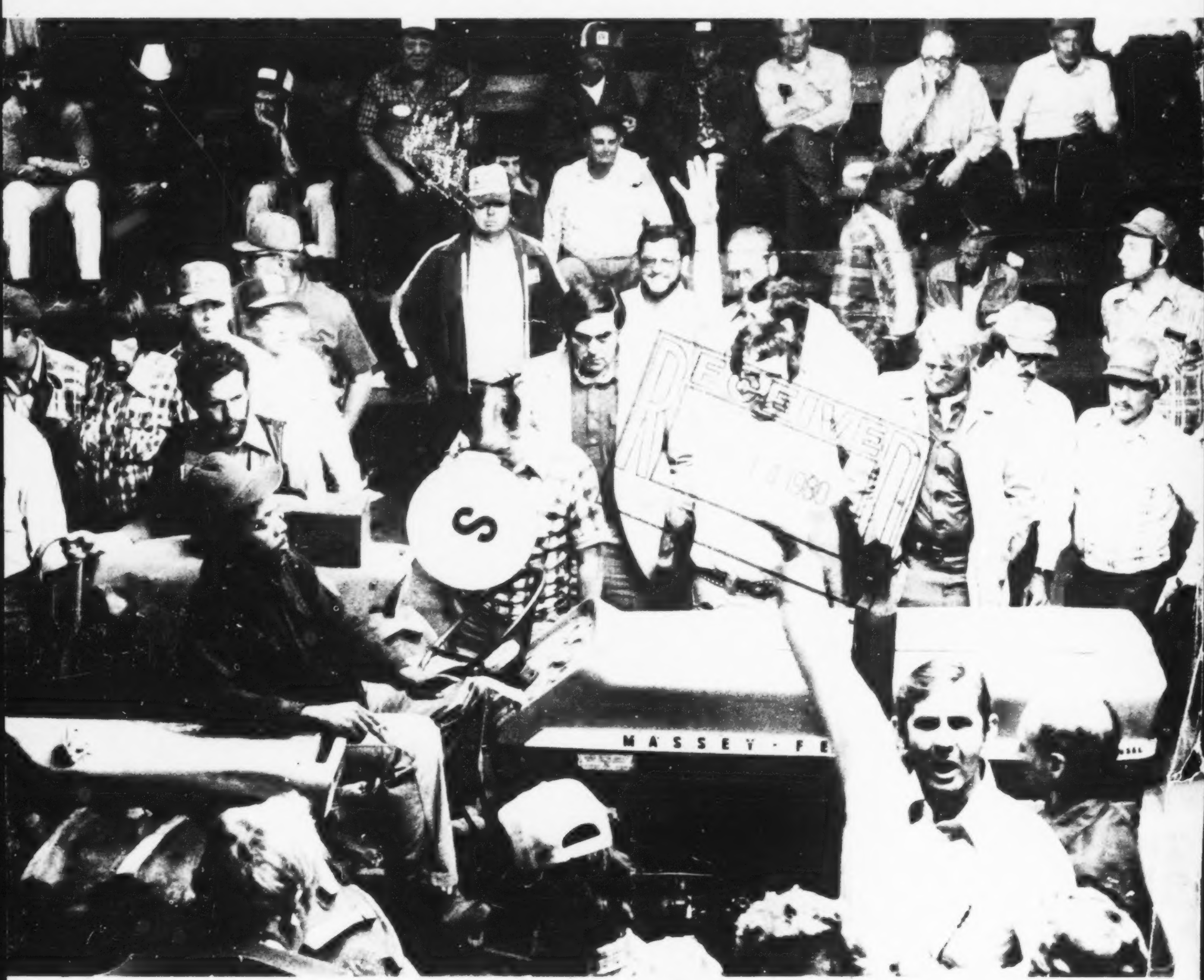
ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

February 21, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

Implement&Tractor



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LLING AHEAD: A look at small-used-tractor market at its core – the Southeast

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INTERTEC PUBLISHING CORP.

February 21, 1980 • Vol. 95 • No. 5
Implement & Tractor
The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

10: The Small-Used-Tractor Market Rolls Ahead. Buyers and sellers at December's Jones Farm Equipment auction had, predictably, conflicting views about how the equipment sold; but the new president of this major Southern small-tractor market was satisfied in December, and looks forward to even better days ahead. Something to think about: Are smaller tractors, to a degree that the big ones are not, *insulated* against recessive economic forces?

16: The Squeeze Is Getting Tighter. Farmers talk about the problems of moving today's bigger-than-ever equipment on highways and byways (with low-hanging wires and branches, hostile traffic, etc.) that aren't ready for them.

24: Has Anybody Seen the Dial Indicator? If, unbeknownst to anyone, it's hiding in a service truck way out in the country when you need it in the shop, where does that put you?—In a bind. Here's what you need to consider if you want to set up your tool room to help, not hinder, productivity.

38: ASAE Meets. Ag engineers ponder government controls, social concerns of farming, China, jobs, and 450 technical reports.

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what's ahead...

I&T
SINCE 1886

February 21, 1980

SO HOW DID THE INDUSTRY DO LAST YEAR? The flash report of the Farm & Industrial Equipment Institute reflects the impact of strikes on the two industry giants, Deere and International Harvester. Deere's output was halted for almost four weeks in October and IHC's strike, which began Nov. 1, was still on in January. As a result, December sales of tractors were off 16 per cent; big 2-wheel-drive units were down 4.6 per cent for the year.

Unit Retail Sales

	December			January-December		
Equipment	1979	1978	Pct. Change	1979	1978	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-99 hp	3,677	4,411	-16.6	65,085	65,343	-0.4
100 hp & over	4,411	5,702	-22.6	62,547	65,530	-4.6
Total 2-wheel dr.	8,088	10,113	-20.0	127,632	130,873	-2.5
4-wheel drive	1,001	743	+34.7	11,457	8,744	+31.0
Total Tractors	9,089	10,856	-16.3	139,089	139,617	-0.4
S-P Combines	1,918	1,785	+7.5	32,235	31,492	+2.4
Balers*	361	429	-15.9	18,762	21,082	-11.0
Forage Harvesters**	425	306	+38.9	12,456	11,598	+7.4
Mower-Conditioners	641	626	+2.4	25,603	25,132	+1.9

*Bales under 200 lbs. **Shear-bar type

TWO FORECASTS OF THE LAWN/GARDEN EQUIPMENT MARKET FOR 1980 are offered by the Outdoor Power Equipment Institute and the Farm & Industrial Equipment Institute.

OPEI reports that the average forecast of 21 companies is for an overall 5 per cent decline in selected industry shipments for the 1980 model year, which began Sept. 1, 1979. Rotary tiller shipments are expected to remain flat at about 572,500 units; other items look less promising: garden tractor shipments down from 254,000 in 1979 to 228,000 in 1980; lawn tractors/riding mowers down from 858,000 to 786,000 units; walk-behind power mowers down from 5.9 million units to 5.625 million.

FIEI got opinions on 1980 from 18 of its members involved in lawn and garden equipment, deriving a median estimated 7 per cent increase in retail dollar volume. Of the 18 respondents, four saw no increase in dollar volume, while percentage increases of 3, 5, 8, 11, 15, 18 and 20 were predicted by two firms each. Factors affecting sales favorably, as cited by respondents: families staying closer to home, performing more property maintenance; more gardening to fight food costs; less pleasure driving, more home improvement; strong demand for snow removal equipment; start of economic recovery in second half. Detrimental factors: tight money, high interest; fewer housing starts; lowered consumer confidence; rising unit costs.

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I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

YODER & FREY, INC.
Archbold, Ohio
(January 7, 1980)

ALLIS-CHALMERS TRACTORS

210 diesel, 1968 (Good)	5950
200 diesel, 1974 (Good)	10,400*
XT190 diesel, 1968 (Good)	6525
XT190 diesel, 1966 (Good)	5900*
XT190, 1966 (Fair)	3500
D21 diesel, 1965 (Fair)	5500*
D19 diesel, 1962 (Fair)	1950
D17, 1965 (Good)	3050
D15, 1964 (Fair)	1575*

DAVID BROWN TRACTORS

1200 diesel, 1966 (Good)	3000*
1200 diesel, 1966 (Fair)	2950
1200, 1964 (Fair)	2500*
990, 1970 (Fair)	1550

CASE TRACTORS

1830, uni-ldr., 1978 (Good)	4100
1270 diesel, 1971 (Fair)	8000*
1170 diesel, 1971 (Good)	8250*
1070 diesel, 1971 (Good)	7600*
1070 diesel, 1971 (Fair)	5400*
1030 diesel, 1967 (Fair)	4350
930 diesel, 1967 (Fair)	4050*
930, 1966 (Fair)	2800*
930, 1965 (Good)	4875
930 diesel, 1965 (Fair)	3800
530, ldr., 1967 (Fair)	2250*
430, ldr., 1967 (Fair)	2575
430, bld., 1957 (Rough)	1500

JOHN DEERE TRACTORS

4520 diesel, 1973 (Good)	9000*
4430 diesel, 1973 (Excellent)	16,200*
4230 diesel, 1974 (Good)	14,000*
4230 diesel, 1974 (Good)	10,750
4020 diesel, 1968 (Good)	7800*
4020 diesel, 1968 (Fair)	6950
4020 diesel, 1967 (Good)	7200*
4020 diesel, 1967 (Good)	7150
4020 diesel, 1967 (Fair)	6200
4020 diesel, 1966 (Good)	7600
4020 diesel, 1966 (Good)	7400*
4020 diesel, 1966 (Fair)	6300
4020, 1966 (Fair)	3400*
4020 diesel, duals, 1965 (Fair)	6500*
4020 diesel, 1965 (Fair)	5950
4010 diesel, 1963 (Good)	4300*
4010, 1961 (Rough)	3050
3020 diesel, duals, 1968 (Fair)	5050
3020 diesel, 1965 (Good)	6350
3020, 1965 (Good)	4500
3020 diesel, 1964 (Good)	4950
3010 diesel, 1962 (Fair)	3500*
3010, 1961 (Good)	3500
3010 diesel, 1960 (Good)	3525
2010, 1960 (Fair)	2000*
2010, 1960 (Rough)	800*
1010, dozer, 1963 (Fair)	3300*
1010, dozer, 1963 (Fair)	3000*
730 diesel, 1959 (Good)	2700*
730 diesel, 1957 (Good)	1800*
730 diesel, 1957 (Good)	1800*
730, 1957 (Good)	2400
730 diesel, 1957 (Rough)	1525
720, 1956 (Fair)	1900
720, 1956 (Fair)	1700*
720 diesel, 1956 (Rough)	1400*
720 diesel, 1956 (Rough)	1200*
630, ldr., 1958 (Good)	2200
420, bld., 1956 (Fair)	1725*
70, 1954 (Fair)	1200*
60, 1956 (Fair)	1150
60, 1954 (Fair)	775
A, ldr., 1951 (Fair)	750*
A, 1948 (Fair)	650

FORD TRACTORS

9600 diesel, 1974 (Good)	10,000*
9000 diesel, 1970 (Good)	7850
8000 diesel, 1969 (Fair)	8100*
6000 diesel, 1964 (Good)	1600*
6000, 1958 (Rough)	1100*
5000, 1974 (Fair)	5650*
5000, 1967 (Rough)	3500*
4000, 1974 (Good)	5825
4000, 1968 (Good)	3400*
4000, 1958 (Good)	1200*
3400, ldr., (Rough)	1600
3000, 1974 (Fair)	3100*
3000 diesel, 1971 (Good)	3500*
3000, ldr., 1969 (Fair)	3400*
3000, 1968 (Fair)	2700*
2000, 1968 (Fair)	2475
860, 1956 (Fair)	1585
860, ldr., 1956 (Fair)	1400*
641, 1955 (Good)	1460
Jub., ldr., 1953 (Fair)	1450
8N, ldr., 1948 (Good)	1475
8N, 1948 (Good)	1410
8N, mo., 1948 (Rough)	800*
9N, ldr., 1946 (Good)	1025
9N, 1946 (Fair)	875
9N, 1946 (Fair)	860
9N, 1946 (Fair)	825*
9N, 1946 (Fair)	800*
9N, 1946 (Fair)	750
9N, 1945 (Rough)	750

INTERNATIONAL HARVESTER TRACTORS

4100, 1967 (Good)	6700*
3444, backhoe, ldr., 1972 (Good)	3750*
1566 diesel, 1975 (Good)	12,500*
1256 diesel, 1967 (Good)	7400*
1206 diesel, 1969 (Good)	6100*
1206 diesel, 1968 (Good)	6750
1206 diesel, 1967 (Fair)	6350
1066 diesel, 1975 (Excellent)	12,200
1066 diesel, 1975 (Fair)	9700*
1066 diesel, 1973 (Excellent)	11,600*
856 diesel, 1974 (Good)	8100*
826 diesel, 1969 (Good)	7000
806 diesel, 1966 (Good)	6500
806, 1965 (Good)	4100*
706 diesel, 1966 (Good)	4500*
706 diesel, 1966 (Fair)	3300
706, 1965 (Rough)	3000*
706, 1965 (Good)	2100*
706, 1964 (Fair)	2150
656, 1968 (Fair)	3800*
656, 1967 (Fair)	3500*
574, 1974 (Good)	4900
560, 1963 (Good)	2150*
560, 1961 (Fair)	1850
560, 1960 (Good)	2100*
560, 1960 (Fair)	1835
560, 1960 (Fair)	1700*
544, 1965 (Fair)	3175
460, 1958 (Fair)	1700*
460, 1961 (Fair)	1350*
460, 1956 (Rough)	1300*
400, 1956 (Fair)	900*
340, 1960 (Fair)	1350*
300, ldr., 1957 (Good)	1350
Sup. MTA, 1954 (Fair)	1175
Sup. MTA, 1954 (Fair)	1000*
Sup. M, 1951 (Fair)	925*
Sup. M, 1951 (Fair)	840
M, 1951 (Fair)	1060
M, 1951 (Fair)	900
M, 1949 (Fair)	750*
M, 1948 (Fair)	750*
M, 1948 (Fair)	725*
Sup. H, 1952 (Fair)	700*
Sup. A, cult., 1952 (Fair)	1240*
Cub 154 Loboy, 1968 (Good)	2100*
Cub Loboy, 1955 (Fair)	1050*
Cub, mo., 1948 (Fair)	850*

MASSEY-FERGUSON TRACTORS

1150 diesel, 1971 (Fair)	5900*
1130 diesel, 1968 (Fair)	4700
285 diesel, 1978 (Excellent)	8525
255 diesel, 1978 (Good)	6500
255, 1977 (Good)	5800*
175, 1969 (Good)	4150
165 diesel, 1973 (Fair)	3450
165 diesel, ldr., 1968 (Fair)	4550*
165, 1968 (Fair)	3350*
165 diesel, 1967 (Fair)	3800
135, ldr., 1973 (Fair)	3350
135, 1972 (Fair)	3000*
135, ldr., 1967 (Fair)	3300*
135, 1966 (Good)	3125
Sup. 90, 1964 (Rough)	1100*
90, 1957 (Fair)	1650*
65, 1958 (Fair)	2225
65 diesel 1958 (Fair)	2000*
50, 1959 (Fair)	1425

MINNEAPOLIS-MOLINE TRACTORS

445, 1960 (Good)	1025*
445, 1958 (Fair)	925

OLIVER TRACTORS

2255 diesel, 1974 (Excellent)	10,800*
1850 diesel, 1969 (Good)	5250
1850, 1966 (Fair)	3100*
1800, 1963 (Good)	2500*
1800, 1963 (Fair)	2750
1800 diesel, 1958 (Good)	4100*
1800 diesel, 1958 (Rough)	2100*
1755, 1973 (Good)	4600*
1650, duals, 1965 (Good)	3000*
1600, 1964 (Good)	2500*
770 diesel, 1957 (Fair)	925
550 diesel, 1963 (Fair)	1850*
Sup. 88, 1952 (Fair)	750*
88, 1950 (Fair)	700
Sup. 77, 1950 (Fair)	570*

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(January 8, 1980)

ALLIS-CHALMERS TRACTORS

7080 diesel, cab, air, 1977 (Excellent)	22,500*
160 diesel, 1972 (Good)	3050

CASE TRACTORS

1175 diesel, 1974 (Fair)	6150*
970 diesel, 1973 (Good)	7400*
930 diesel, cab, 1967 (Rough)	1025
580 diesel, ldr., backhoe, 1972 (Good)	6750
580 diesel, ldr., backhoe, 1967 (Rough)	2850
580 diesel, ldr., backhoe, 1966 (Rough)	2975

DAVID BROWN TRACTORS

990 diesel, 1968 (Excellent)	2800
990 diesel, 1965 (Good)	1300
990 diesel, 1964 (Rough)	750

MASSEY-FERGUSON TRACTORS

1135 diesel, cab, air, 1977 (Good)	11,800*
1130 diesel, duals, 1969 (Good)	5000*
1105 diesel, cab, air, 1977 (Excellent)	11,000*
1085 diesel, 1978 (Good)	8500*
1085 diesel, 1977 (Good)	7900*
1080 diesel, 1971 (Good)	4450
1080 diesel, 1969 (Good)	4200
285 diesel, 1977 (Excellent)	10,500*
275 diesel, 1975 (Good)	6600
275 diesel, 1975 (Good)	6500
275 diesel, 1975 (Good)	6400
265 diesel, 1976 (Fair)	4700
235 diesel, 1975 (Good)	4450
235 diesel, 1975 (Good)	4400
180 diesel, 1968 (Good)	3450*
180 diesel, 1966 (Good)	3400*
175 diesel, 1972 (Good)	4650
175 diesel, 1972 (Good)	4750
175 diesel, 1972 (Good)	4450
175 diesel, 1971 (Good)	4300
175 diesel, 1968 (Good)	4200
175 diesel, 1968 (Fair)	3400
175 diesel, 1966 (Fair)	2800
165 diesel, 1970 (Fair)	3200*
165 diesel, 1969 (Good)	3450
165 diesel, 1968 (Excellent)	4000
165 diesel, 1967 (Excellent)	4650
165 diesel, 1966 (Fair)	2825
165 diesel, 1966 (Fair)	2950
165 diesel, 1966 (Good)	3300
165 diesel, 1966 (Good)	3350*
150 diesel, 1968 (Good)	2750
150 diesel, 1967 (Good)	3150*
150 diesel, 1965 (Excellent)	3500*
135 diesel, 1972 (Excellent)	4400*
135, 1969 (Excellent)	3900
135 diesel, 1969 (Excellent)	4300
135 diesel, 1968 (Good)	3550
135 diesel, 1967 (Good)	2850*
135 diesel, 1967 (Good)	3125
135 diesel, 1967 (Fair)	2550
135 diesel, 1966 (Fair)	2750
135 diesel, 1966 (Excellent)	3500
130 diesel, 1969 (Good)	1650
65 diesel, 1963 (Good)	2300*
65 diesel, 1959 (Good)	1650
65, 1958 (Good)	1600
50, 1962 (Good)	2325
50, 1959 (Fair)	1700
50, 1958 (Fair)	1750*
50, 1958 (Fair)	1550*
35 diesel, 1962 (Good)	2350
35 diesel, 1961 (Excellent)	2750
35, 1956 (Good)	1950
TO30, 1953 (Good)	1050*
TO30, 1952 (Fair)	700*
TO30, 1952 (Good)	1050

25 diesel, 1964 (Good)	1775
20 diesel, ldr., 1970 (Good)	2100
TO20, 1951 (Good)	875*
TO20, 1950 (Good)	975
TO20, 1950 (Good)	875
TO20, 1949 (Good)	850

FORD-FERGUSON TRACTORS

9N, sweeper, 1946 (Fair)	750*
9N, 1946 (Rough)	560

FORD TRACTORS

8600 diesel, cab, 1974 (Good)	7700
8000 diesel, cab, duals, 1968 (Good)	5400
5500 diesel, ldr., backhoe, 1966 (Good)	5000
5000 diesel, 1971 (Excellent)	5975
5000 diesel, 1968 (Excellent)	5000
4500 diesel, ldr., backhoe, 1974 (Good)	5350
4400 diesel, ldr., backhoe, 1971 (Good)	4250*
4000 diesel, 1970 (Excellent)	5400*
4000, 1966 (Rough)	2300
4000, 1963 (Fair)	1400
4000 diesel, 1963 (Fair)	1350*
3400 diesel, 1974 (Fair)	1900
3000, 1970 (Good)	3300*
3000 diesel, 1970 (Excellent)	3950
3000, 1969 (Excellent)	3625
3000, 1968 (Good)	3050
3000 diesel, 1968 (Good)	3250
3000 diesel, 1967 (Excellent)	3725
3000 diesel, Select-O-Speed, 1967 (Fair)	1850
3000 diesel, ldr., 1966 (Fair)	2100
3000, Select-O-Speed, 1965 (Fair)	1750*
3000, 1965 (Fair)	2350
2000, 1973 (Good)	3050
2000 diesel, 1967 (Good)	3100*
2000, 1963 (Good)	2450
1000 diesel, 1976 (Good)	3100
871, Select-O-Speed, 1958 (Rough)	900*
851 diesel, 1958 (Rough)	1250
850, 1955 (Good)	2000*
850, 1955 (Fair)	1500
841 diesel, 1958 (Good)	2200*
841 diesel, 1958 (Rough)	1400*
660, 1957 (Good)	1800
650, 1957 (Excellent)	2450
641, 1959 (Good)	2100*
641, 1958 (Good)	2250*
641, 1958 (Good)	2225
641 diesel, 1958 (Good)	2200
640, 1956 (Excellent)	2400
621, 1960 (Good)	1825
621, 1958 (Good)	2100*
Sup. Dexta, 1962 (Good)	1600*
Dexta, 1959 (Good)	1200
NAA, 1954 (Good)	1675
NAA, 1954 (Good)	1700*
NAA, 1954 (Good)	1800*
Jub., 1953 (Good)	1700
Jub., 1953 (Fair)	1375
8N, 1952 (Good)	1350*
8N, 1952 (Excellent)	1800
8N, 1951 (Good)	1400
8N, 1951 (Good)	1375*
8N, 1950 (Excellent)	1600*
8N, 1950 (Good)	1050
8N, 1949 (Fair)	750*
8N, 1949 (Good)	1050*
8N, 1948 (Rough)	650
8N, 1948 (Good)	1180

INTERNATIONAL HARVESTER TRACTORS

4400 diesel, (Fair)	2900
1468 diesel, 1972 (Good)	6450
1468 diesel, 1975 (Good)	12,300*
1256 diesel, 1967 (Rough)	2500
1086 diesel, 1976 (Excellent)	13,800
1086 diesel, 1975 (Good)	6250*
856 diesel, 1967 (Good)	6250
766 diesel, 1973 (Good)	6950*
674 diesel, 1974 (Good)	6000
674 diesel, 1973 (Fair)	5300*
656 diesel, 1970 (Good)	4600
606 diesel, 1966 (Rough)	850
574 diesel, 1973 (Good)	2700
2544 diesel, ldr., trencher, 1971 (Good)	3600

504 diesel, 1963 (Rough)	800*
504 diesel, 1963 (Rough)	675
460, ldr., 1959 (Excellent)	2800
454 diesel, 1973 (Good)	3350
2444, 1968 (Good)	1525*
2444, 1968 (Fair)	925
2444, 1968 (Rough)	675*
444 diesel, 1970 (Fair)	1050*
424, 1966 (Good)	1100
3414, ldr., backhoe, 1960 (Good)	2425
350, ldr., 1957 (Rough)	110
2400, mo., 1971 (Rough)	1325
2400, mo., 1971 (Rough)	1275
300, ldr., 1955 (Fair)	850
240, ldr., 1959 (Excellent)	3000
240, ldr., 1959 (Good)	1300
M, 1950 (Good)	550
Cub Loboy, mo., 1968 (Good)	1300*
Cub Loboy, mo., 1955 (Good)	1375
Cub, plow, 1948 (Fair)	875
Cub, mo., plow, 1948 (Good)	1050

JOHN DEERE TRACTORS

5020 diesel, duals, 1967 (Good)	6000
4440 diesel, cab, 1978 (Excellent)	27,000
4430 diesel, cab, air, 1976 (Good)	17,400*
4430 diesel, cab, air, 1976 (Good)	14,100
4320 diesel, 1971 (Good)	10,750
4030 diesel, 1975 (Fair)	7700
4030 diesel, 1974 (Fair)	7900*
4030 diesel, 1973 (Fair)	7450
4020 diesel, 1969 (Fair)	4500
4020 diesel, 1968 (Good)	6600
4020 diesel, 1968 (Good)	5100
4020 diesel, 1968 (Good)	6100*
4020 diesel, 1967 (Good)	6100
4020 diesel, 1967 (Good)	6200*
4020 diesel, 1966 (Excellent)	6800
4020 diesel, 1965 (Excellent)	6200*
4010 diesel, 1962 (Good)	4650*
4010 diesel, 1961 (Good)	4600
3020 diesel, 1969 (Excellent)	6400
2640 diesel, 1977 (Good)	6400*
2630 diesel, 1974 (Good)	6500*
1020, 1966 (Excellent)	3650
1020 diesel, 1966 (Excellent)	3450*
1020 diesel, 1966 (Excellent)	3600
630, 1959 (Good)	1100
430, 1959 (Good)	950*
302 diesel, bld., trencher, 1975 (Good)	3750*

KUBOTA TRACTORS

B6000 diesel, trencher, 1974 (Excellent)	2100
L245 diesel, ldr., backhoe, 1974 (Good)	2900*
L245 diesel, ldr., backhoe, 1974 (Excellent)	4300

(More...)

Auctions

(continued)

LONG TRACTORS

560 diesel, 1974 (Excellent)	3700
445 diesel, 1974 (Excellent)	3400
445 diesel, ldr., 1974 (Good)	2375
384 diesel, 1973 (Fair)	1750*
350 diesel, 1973 (Good)	2850
350 diesel, 1973 (Good)	2450

OLIVER TRACTORS

2255 diesel, duals, 1974 (Good)	6500
1650 diesel, 1968 (Fair)	2750*
1250 diesel, 1966 (Good)	1700

BILL ENLOW
TRACTOR SALES
Tulsa, Okla.
(January 12, 1980)

ALLIS-CHALMERS TRACTORS

C, 1946 (Good)	325
D-19 diesel, cab, 1963 (Good)	3200
D-21 diesel, cab, 1967 (Good)	4775

CASE TRACTORS

430, ldr., 1967 (Good)	3250
870 diesel, cab, 1971 (Good)	6850

FERGUSON TRACTORS

20, 1949 (Fair)	825
20, 1949 (Good)	975
20, 1950 (Good)	935
30, 1952 (Good)	1200
40, 1956 (Good)	1750
40, 1956 (Fair)	1300*

FORD TRACTORS

9N, 1944 (Fair)	750
9N, 1946 (Fair)	900
9N, 1947 (Good)	1050*
8N, 1946 (Good)	1200*
8N, 1946 (Rough)	750*
8N, 1947 (Good)	1250
8N, ldr., 1947 (Good)	1200
8N, 1947 (Good)	1225
8N, 1947 (Fair)	1075
8N, 1948 (Good)	1200*
8N, 1948 (Fair)	1050
8N, 1948 (Fair)	1125
8N, 1948 (Fair)	1050*
8N, ldr., 1948 (Good)	1250*
8N, 1948 (Fair)	1050
8N, 1948 (Fair)	1100*
8N, 1949 (Fair)	1050
8N, 1949 (Fair)	1050
8N, 1949 (Fair)	1000
8N, 1949 (Fair)	1050
8N, 1950 (Good)	1250
8N, 1950 (Fair)	1125
8N, 1950 (Good)	1150
8N, 1951 (Good)	1500*
8N, 1951 (Good)	1450
8N, 1951 (Good)	1300*
8N, 1951 (Good)	1350
8N, 1951 (Good)	1350
8N, 1951 (Good)	1300
8N, 1951 (Good)	1400
8N, 1951 (Good)	1375
8N, 1952 (Good)	1525
8N, 1952 (Good)	1300
8N, 1952 (Good)	1325*
8N, 1952 (Good)	1350*
8N, 1952 (Good)	1500
8N, 1952 (Good)	1200*
NAA, 1953 (Fair)	1550
NAA, 1953 (Fair)	1500
NAA, 1953 (Fair)	1600
NAA, 1953 (Good)	1700
NAA, 1953 (Fair)	1650
NAA, 1953 (Good)	1700*
NAA, 1953 (Fair)	1600
NAA, 1954 (Good)	1850*
NAA, ldr., 1954 (Good)	2100
NAA, 1954 (Good)	1950
600, 1955 (Good)	1800
600, 1955 (Fair)	1600
800, 1955 (Fair)	1675
600, 1955 (Good)	1700
600, 1956 (Fair)	1600
600, 1956 (Fair)	1700
640, ldr., 1957 (Good)	2750
640, 1957 (Good)	2250
800, 1955 (Good)	2025
800, 1956 (Good)	2100
800, 1956 (Good)	1800*
800, 1957 (Good)	1775
860, 1957 (Good)	2000*
860, 1957 (Good)	2700
601, 1959 (Good)	2150
601, 1960 (Good)	1950
641, 1960 (Good)	1975
861, 1961 (Good)	2175
871, Select-O-Speed, 1961 (Fair)	1300*
900, 1956 (Fair)	1350
Dexta diesel, 1961 (Fair)	1050
Mjr. Fordson, 1962 (Fair)	750
2000, 1965 (Good)	2650*
2000, 1966 (Fair)	2400*
3000, 1966 (Fair)	2000
3000, 1967 (Good)	2950
3000 diesel, 1967 (Fair)	2675
3000 diesel, 1969 (Good)	3400
3400 diesel, ldr., 1968 (Good)	3675*
3500 diesel, backhoe, 1971 (Good)	5550*
3600 diesel, (New)	6900*
4000, 1962 (Fair)	1550
4000 diesel, 1965 (Good)	3200*
4000 diesel, 1966 (Good)	3400*
4000 diesel, 1967 (Good)	3450*
4000 diesel, 1967 (Good)	3550
5000 diesel, 1967 (Good)	4250*
5000 diesel, 1968 (Good)	4300
5000 diesel, 1968 (Good)	4050
5000 diesel, 1969 (Good)	4400
5000, 1970 (Good)	4700
5000, 1973 (Good)	5500*
6000, 1961 (Fair)	1525
6000, 1961 (Fair)	1250
8000, 1971 (Good)	7000
9000, cab, 1970 (Good)	7800

INTERNATIONAL HARVESTER TRACTORS

Cub Loboy, 1968 (Fair)	1775
140, 1968 (Good)	1600
C, 1948 (Good)	500
M-D, 1949 (Good)	810
R-275 diesel, ldr., 1960 (Good)	2075
460 LP, ldr., 1961 (Fair)	1250*
404, 1963 (Fair)	1025
404, 1965 (Fair)	1025
3414 diesel, backhoe, 1966 (Good)	3100*
574 diesel, 1972 (Good)	5500*
806 diesel, 1966 (Good)	4900*
856 diesel, cab, 1970 (Good)	6050
856 diesel, cab, 1971 (Good)	5900*
TD-24 diesel, dozer, 1958 (Good)	5000*

JOHN DEERE TRACTORS

B, 1950 (Fair)	150
MT, 1949 (Good)	750
40, 1954 (Good)	1250
70, 1955 (Fair)	1300
70, 1956 (Fair)	1400*
620, 1957 (Fair)	950
820 diesel, 1958 (Good)	2875
1010, 1962 (Good)	1850
2010, 1964 (Rough)	1000
2010, 1964 (Fair)	1525
2010, 1965 (Good)	1775
3010 LP, 1962 (Good)	2875
4010 LP, 1961 (Good)	3100*
1020 diesel, 1972 (Good)	4000
1530 diesel, 1974 (Good)	5050

4430 diesel, 1976 (Good).....11,900
4440 diesel, cab, 1978 (Excellent) 27,800
300 diesel, backhoe, 1971 (Good) 5000

MASSEY-FERGUSON TRACTORS

35, 1958 (Rough) 1100
35, 1959 (Fair)................1500*
35, 1959 (Good) 1700
35, 1960 (Fair)................1650*
35, 1960 (Good) 1800
35, 1961 (Good) 1700
35 diesel, 1961 (Good) 2300
35 diesel, 1961 (Good) 2250
50, 1959 (Fair)................1550
50, 1962 (Good) 1725
50, 1963 (Fair)................1675*
50, 1963 (Good) 1950
50, 1963 (Good) 1900
50, 1965 (Good) 2075
65, 1958 (Good) 2200*
65 diesel, 1959 (Good) 2250*
65 diesel, 1959 (Good) 2200
65, 1959 (Rough) 1400
65, 1960 (Fair)................1600*
65 diesel, 1960 (Good) 1850*
65, 1960 (Fair)................1700*
65 diesel, 1961 (Good) 2000
65, 1961 (Good) 1850*
65 diesel, 1961 (Good) 2400
65, 1962 (Good) 1900*
65, 1962 (Fair)................1550
65 diesel, 1963 (Good) 1900*
65, 1964 (Fair)................1750*
65 diesel, 1964 (Good) 2750
65 diesel, 1965 (Good) 2600
65 diesel, 1965 (Good) 3000
65 diesel, 1965 (Good) 2975
65 diesel, 1965 (Good) 3000
135 diesel, 1965 (Good) 2900
135 diesel, 1966 (Good) 3075
135, 1966 (Fair)...............2575
135, 1967 (Good) 2750
135, 1968 (Fair)...............2700*
135 diesel, 1968 (Good) 3300*
135, 1969 (Good) 3200
135 diesel, 1970 (Good) 3600
135, 1971 (Good) 3400
135 diesel, 1972 (Good) 3900
135 diesel, 1972 (Fair).........2950
165 diesel, 1965 (Good) 3500
165 diesel, ldr., 1967 (Good) ...3900
165 diesel, 1969 (Good) 4225
165 diesel, 1969 (Good) 3900
165 diesel, 1969 (Good) 3550*
165 diesel, 1970 (Fair).........3050
165 diesel, 1971 (Good) 3500
165 diesel, 1973 (Good) 3650*
165 diesel, 1973 (Fair).........3200
165 diesel, 1973 (Good) 3700
165 diesel, 1974 (Excellent) 5025
175 diesel, 1967 (Fair).........3600
175 diesel, 1968 (Good) 4450
175, ldr., 1969 (Good).........4425
175 diesel, 1970 (Good) 4950
175 diesel, 1972 (Good) 4875
180 diesel, 1967 (Good) 3625
180 diesel, 1967 (Good) 3575
180 diesel, 1968 (Fair).........3300
202, ldr., 1965 (Fair) 2500*
202, 1966 (Rough) 1750
200 diesel, ldr., 1970 (Good) ...4950
230 diesel, (New).............6300
230 diesel, (New).............6300
230 diesel, (New).............6250
235 diesel, 1975 (Good) 3950*
235, 1976 (Good) 3750
245 diesel, 1977 (Good) 5750
245 diesel (New)..............7450
245 diesel (New)..............7100*
245 diesel (New)..............7100
245 diesel, (New).............6950
245 diesel (New)..............7050
255 diesel, 1977 (Good) 5800*
1080 diesel, 1970 (Good) 4800
1130 diesel, 1971 (Good) 5000

LONG TRACTOR

460 diesel, 1970 (Good) 4000

MINNEAPOLIS-MOLINE TRACTOR

G1000 diesel, 1968 (Good).....3900

OLIVER TRACTOR

1250 diesel, 1968 (Good) 3500*

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

NOTE

ONLY THE FOLLOWING PAGES OF THIS PUBLICATION

HAVE BEEN FILMED

Cover 1, p. 3,

20, 40-41.

March 7, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

Implement & Tractor

C 4725-1 U recd 4/18/80

Specializing in BIG POWER

page 12

BEARCAT
PT225

In the I&T Manufacturers Edition
Technology + Engineers = Profits

March 7, 1980 • Vol. 95 • No. 6

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

8: FIEI Marketing & Management Conference. The issue of big government dominates, as speakers focus on electing fiscally responsible congressmen, re-establishing incentives, freedom from restraints on research, declining productivity and executive stress.

12: Aiming at Big Power Specialization. Earl Christianson reasons that American farmers look for quality in a dealership—that means specialization—and *that* means "sophistication." Hence, you have CI Equipment, Elbow Lake, Minn., a four-wheel-drive specialty operation with Cadillac looks and style, and with a shop that aims to give Caterpillar-type service.

16: M&W's 'Aquahol' Injection System. A new water-alcohol injection system for turbocharged diesel tractors is said to cut diesel fuel by 30 per cent with no loss of horsepower.

22: Under-Row Ripping: Potential and Problems. The practicability of sub-soiling has been a subject of debate for many years, but recent tests have determined that under certain conditions the practice will improve root development and crop yield.

32: Britain's Smithfield Show Reflects Lackluster Market. The last remaining British-made combine, the Fisher-Humphries, leads the annual parade of European farm equipment.

DEPARTMENTS

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INTERTEC PUBLISHING CORP.

RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors				Cumulative for Jan.-Nov., 1978				Cumulative for Jan.-Nov., 1979			
	Nov., 1978		Nov., 1979		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	177	40	94	27	2,636	52	2,688	804	2,531	41	2,572	600
Alaska	.....	6	.....	2	16	.....	16	52	19	1	20	38
Arizona	18	56	26	44	642	57	699	634	615	106	721	645
Arkansas	255	48	171	33	3,340	284	3,624	864	3,489	264	3,753	661
California	285	280	287	266	3,961	299	4,260	3,484	4,321	360	4,681	3,615
Colorado	25	47	20	49	891	88	979	738	964	167	1,131	693
Connecticut	16	37	17	16	186	3	189	341	180	2	182	260
Delaware	9	4	8	6	160	14	174	79	211	19	230	53
Florida	141	131	83	105	2,204	87	2,291	1,589	2,073	84	2,157	1,642
Georgia	176	55	127	46	3,856	56	3,912	926	3,487	45	3,532	848
Hawaii	3	5	1	8	67	6	73	90	50	4	54	103
Idaho	73	23	62	13	1,091	133	1,224	263	995	166	1,161	198
Illinois	403	162	323	85	7,108	739	7,847	1,997	6,287	865	7,152	1,635
Indiana	258	130	233	46	4,615	431	5,046	1,306	3,939	508	4,447	866
Iowa	547	52	337	26	8,298	448	8,746	564	8,290	735	9,025	452
Kansas	140	30	171	28	3,234	457	3,691	372	3,898	594	4,492	384
Kentucky	230	52	124	27	4,459	98	4,557	1,031	4,148	101	4,249	779
Louisiana	184	79	119	63	2,428	220	2,648	1,269	2,353	181	2,534	850
Maine	13	13	6	5	236	1	237	152	215	2	217	133
Maryland	38	29	27	38	723	22	745	636	751	40	791	514
Massachusetts	8	35	12	24	126	.....	126	479	138	.....	138	348
Michigan	168	139	116	78	2,935	228	3,163	1,505	2,656	258	2,914	1,434
Minnesota	348	53	361	21	5,965	535	6,500	621	5,742	922	6,664	699
Mississippi	238	36	170	21	3,337	198	3,535	746	3,179	156	3,335	572
Missouri	371	66	204	51	4,696	225	4,921	1,093	5,009	275	5,284	923
Montana	87	16	47	17	760	397	1,157	209	855	419	1,274	183
Nebraska	150	25	148	19	3,629	181	3,810	325	4,046	313	4,359	285
Nevada	1	13	4	15	77	1	78	212	119	9	128	215
New Hampshire	15	22	3	5	136	.....	136	157	135	1	136	111
New Jersey	10	56	14	37	335	6	341	762	289	8	297	686
New Mexico	11	19	15	13	381	23	404	355	429	24	453	323
New York	190	77	169	64	2,602	98	2,700	1,403	2,543	124	2,667	1,108
North Carolina	304	161	139	37	4,214	49	4,263	1,153	3,733	74	3,807	870
North Dakota	141	11	131	13	2,366	793	3,159	266	2,289	1,071	3,360	237
Ohio	321	208	247	77	5,255	320	5,575	2,051	4,229	387	4,616	1,673
Oklahoma	99	47	119	34	2,616	234	2,850	835	3,212	430	3,642	723
Oregon	62	40	54	44	1,262	78	1,340	584	1,197	95	1,292	535
Pennsylvania	113	159	127	71	2,552	27	2,579	1,918	2,247	43	2,290	1,429
Rhode Island	.....	5	2	.....	25	.....	25	62	25	.....	25	40
South Carolina	82	39	65	37	1,711	28	1,739	566	1,715	41	1,756	476
South Dakota	108	26	104	9	2,310	256	2,566	193	2,208	335	2,543	178
Tennessee	294	59	121	40	4,228	78	4,306	1,068	3,683	72	3,755	879
Texas	429	310	413	284	8,213	372	8,585	4,185	9,592	589	10,181	4,254
Utah	22	18	30	37	569	16	585	450	653	18	671	459
Vermont	20	6	14	3	357	4	361	89	373	9	382	71
Virginia	139	55	101	51	2,400	10	2,410	1,026	2,372	18	2,390	698
Washington	95	58	83	44	1,473	184	1,657	958	1,545	190	1,735	824
West Virginia	27	28	10	29	572	.....	572	359	564	.....	564	272
Wisconsin	311	46	281	39	5,021	144	5,165	742	5,370	248	5,618	714
Wyoming	8	14	18	20	340	23	363	212	398	38	436	245
U.S. Government	2	182	9	13	46	3	49	929	139	.....	139	547
Miscellaneous‡	.....	72	.....	91	85	3	88	1,316	44	4	48	1,552
TOTAL	**7,165**	**3,360**	**5,567**	**2,271**	**120,745**	**8,009**	**128,754**	**44,020**	**119,544**	**10,456**	**130,000**	**38,533**

Data released January 23, 1980, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland, Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; Hy-Dynamic; International Harvester; JCB Excavators; K-D Mfg.; Long; Massey-Ferguson; Pettibone; R. M. Wade (Satoh); Steiger; Versatile; White; and Woods & Copeland.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales that cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-Nov., 1978 and 1979 (1)

(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled: Power Units		Windrowers Self-Propelled: Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979
Alabama	514	478	159	102	375	248	1	1	1	1	192	213	61	59
Alaska	.....	3	.....	.....	6	9	.....	.....	.....	.....	.....	.....	1	.....
Arizona	47	30	10	5	35	43	73	60	78	66	6	4	11	15
Arkansas	1,011	1,062	6	11	506	417	2	2	1	1	58	57	21	26
California	248	231	74	61	207	239	294	285	314	313	5	15	81	77
Colorado	242	299	124	152	417	498	252	279	252	286	46	67	160	182
Connecticut	1	2	2	1	76	65	1	.....	1	.....	1	2	39	66
Delaware	47	55	37	36	34	18	3	.....	3	.....	4	10	14	14
Florida	156	136	92	72	135	113	.....	2	.....	2	62	62	32	25
Georgia	682	724	550	503	360	240	5	1	5	1	456	493	137	130
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	.....
Idaho	353	357	15	11	517	492	296	354	305	365	23	41	62	70
Illinois	3,408	3,147	3,335	3,326	406	393	30	15	30	15	628	633	345	360
Indiana	1,938	1,865	1,926	1,968	488	414	15	12	15	12	542	566	271	256
Iowa	3,458	3,265	3,661	3,905	481	456	257	260	264	256	1,639	1,917	941	911
Kansas	1,502	1,717	366	388	430	492	346	403	354	415	261	331	275	340
Kentucky	486	547	389	384	654	454	4	3	4	4	270	312	252	225
Louisiana	621	632	8	1	180	159	1	.....	1	.....	12	13	24	21
Maine	8	2	.....	.....	92	88	.....	3	.....	3	.....	1	36	63
Maryland	161	148	156	161	163	133	12	8	13	7	41	46	87	117
Massachusetts	.....	.....	1	.....	57	57	1	1	1	.....	4	1	32	36
Michigan	523	569	486	528	572	478	72	81	72	85	247	250	449	507
Minnesota	1,970	1,925	1,689	1,815	1,081	952	843	754	873	777	644	862	1,064	1,172
Mississippi	765	857	19	9	257	205	.....	.....	.....	.....	64	61	70	74
Missouri	1,472	1,567	807	893	736	675	90	88	94	90	517	617	201	213
Montana	432	376	1	5	462	402	566	493	624	531	57	70	73	46
Nebraska	1,643	1,708	1,528	1,693	274	252	453	503	470	510	435	577	421	476
Nevada	7	3	.....	.....	51	54	66	74	71	77	1	1	7	6
New Hampshire	.....	.....	.....	.....	53	59	1	1	1	1	.....	2	27	37
New Jersey	62	45	28	15	75	65	3	.....	3	.....	11	13	38	31
New Mexico	20	30	9	12	179	168	98	98	97	98	13	18	9	11
New York	145	151	186	260	865	799	82	73	84	73	160	122	876	1,028
North Carolina	546	627	503	505	562	319	2	3	2	3	228	242	141	132
North Dakota	1,122	1,310	56	68	143	94	1,053	914	1,119	980	111	178	144	146
Ohio	1,550	1,557	1,341	1,462	883	691	17	14	17	14	459	504	340	377
Oklahoma	428	572	18	12	726	894	145	164	150	169	118	151	39	60
Oregon	243	206	14	13	381	323	337	251	354	253	18	35	92	83
Pennsylvania	247	258	280	280	1,114	953	84	89	83	90	290	318	677	757
Rhode Island	.....	.....	.....	.....	8	6	.....	.....	.....	.....	.....	1	7	1
South Carolina	333	360	169	185	174	101	.....	.....	.....	.....	101	125	41	37
South Dakota	675	678	466	497	268	179	809	776	849	837	277	383	406	481
Tennessee	627	655	237	214	796	600	2	1	2	1	230	261	224	221
Texas	862	930	270	274	1,341	1,417	97	118	103	129	202	237	59	84
Utah	49	40	13	15	332	320	153	148	156	150	58	71	92	95
Vermont	.....	.....	2	.....	127	132	2	1	2	1	2	2	124	175
Virginia	198	234	169	203	599	477	9	7	9	7	128	147	275	248
Washington	321	367	21	71	366	342	185	208	188	219	23	20	124	101
West Virginia	3	3	4	6	366	260	.....	.....	.....	.....	27	32	54	53
Wisconsin	531	541	618	665	2,021	1,948	369	388	373	392	487	593	2,232	2,335
Wyoming	48	49	11	15	228	208	185	193	193	203	16	24	35	49
U.S. Government	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....
TOTAL	**29,706**	**30,317**	**19,876**	**20,802**	**20,657**	**18,401**	**7,316**	**7,129**	**7,631**	**7,437**	**9,176**	**10,707**	**11,232**	**12,031**

Data released Jan. 23, 1980, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types		Manure Spreaders Conveyor-Type		
1978	1979	1978	1979	
261	236	20	18	Alabama
1	2	1	1	Alaska
3	6	7	9	Arizona
501	570	92	108	Arkansas
53	48	66	78	California
122	164	41	66	Colorado
90	90	81	78	Connecticut
30	18	58	68	Delaware
135	119	27	29	Florida
332	272	34	47	Georgia
.....	1	.....	2	Hawaii
134	119	134	122	Idaho
765	755	1,051	878	Illinois
711	691	736	686	Indiana
1,474	1,450	2,188	2,271	Iowa
694	981	207	252	Kansas
1,194	1,186	298	294	Kentucky
116	121	21	24	Louisiana
113	120	113	114	Maine
168	175	234	223	Maryland
81	81	59	72	Massachusetts
924	767	755	767	Michigan
1,274	1,437	1,599	1,832	Minnesota
196	195	25	31	Mississippi
1,592	1,750	371	422	Missouri
136	121	62	48	Montana
443	601	423	529	Nebraska
3	12	4	6	Nevada
82	69	61	51	New Hampshire
97	77	55	59	New Jersey
38	35	3	6	New Mexico
1,216	1,245	1,546	1,479	New York
478	376	164	158	North Carolina
129	169	182	109	North Dakota
1,237	1,086	967	976	Ohio
693	944	28	34	Oklahoma
241	193	98	114	Oregon
1,296	1,213	1,254	1,311	Pennsylvania
6	6	3	1	Rhode Island
170	139	30	31	South Carolina
120	146	292	348	South Dakota
853	925	153	175	Tennessee
1,329	1,515	126	146	Texas
188	180	145	95	Utah
242	249	239	264	Vermont
658	746	234	241	Virginia
199	153	110	138	Washington
224	238	83	90	West Virginia
3,138	3,101	2,713	2,826	Wisconsin
149	69	46	49	Wyoming
.....	.....	.....	.....	U.S. Government
.....	.....	1	1	Miscellaneous
24,329	**24,982**	**17,240**	**17,777**	**TOTAL**

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March 21, 1980
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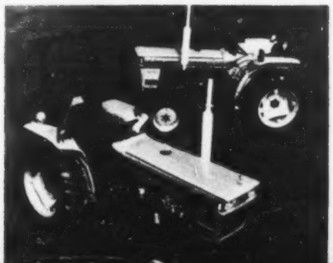
Parts
WORK GLOVES

Talking about managing sales. page 16

Where do farmers buy parts, etc.? page 26



How many tractors were imported in 1979? page 4

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March 21, 1980 • Vol. 95 • No. 7

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

6: **It's a Solar Still!** Farm alcohol production is illegal in Australia, but the Australian developer of this solar distillation process hopes to find a large market in the U.S. The goal: commercial production later this year.

16: **Ernie Vietze Talks About Sales Management.** Dealers and other executives in this industry hear a lot about the whiz of a salesman who rises beyond his abilities to become a mediocre sales manager. But sometimes it works out better. Witness Ernie Vietze, a man who loved—and loves—to sell farm equipment, and who brings his salesmen to love it too.

20: **Selling to the Small-Time, Part-Time Farmer.** Dealers and manufacturers, who are able to scale down their thinking from giant tractors and combines to small, simple tools and machines for the sundown farmer, will find a large market out there, eager to be served.

26: **Where Do Farmers Go to Get Their Machinery, Parts, Service?** An encouraging report (to farm equipment dealers, anyway) on farmers' purchasing preferences, based on a USDA survey.

DEPARTMENTS

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(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-Dec., 1978				Cumulative for Jan.-Dec., 1979			
	Dec., 1978		Dec., 1979		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	181	40	130	26	2,807	62	2,869	844	2,654	48	2,702	626
Arizona	56	58	76	55	686	69	755	692	687	110	797	700
Arkansas	281	53	260	31	3,601	304	3,905	917	3,708	305	4,013	692
California	424	239	407	217	4,351	333	4,684	3,723	4,675	413	5,088	3,832
Colorado	57	43	62	48	947	89	1,036	781	1,009	184	1,193	741
Connecticut	14	24	7	22	200	3	203	365	187	2	189	282
Delaware	15	8	25	3	175	14	189	87	236	19	255	56
Florida	145	81	184	92	2,339	97	2,436	1,670	2,247	94	2,341	1,733
Georgia	266	54	185	39	4,121	57	4,178	980	3,663	54	3,717	887
Idaho	79	15	98	14	1,158	145	1,303	278	1,083	180	1,263	212
Illinois	740	84	499	82	7,774	813	8,587	2,081	6,720	931	7,651	1,717
Indiana	494	64	403	89	5,069	471	5,540	1,370	4,278	572	4,850	955
Iowa	933	31	646	40	9,187	492	9,679	595	8,867	804	9,671	492
Kansas	288	28	332	32	3,491	488	3,979	400	4,162	662	4,824	416
Kentucky	294	57	164	66	4,747	104	4,851	1,088	4,369	110	4,479	845
Louisiana	198	69	196	38	2,600	246	2,846	1,338	2,526	204	2,730	888
Maine	8	11	12	11	244	1	245	163	227	2	229	144
Maryland	68	29	51	43	791	22	813	665	800	42	842	557
Massachusetts	3	38	6	28	129	.....	129	517	144	.....	144	376
Michigan	248	86	342	102	3,162	250	3,412	1,591	2,959	297	3,256	1,536
Minnesota	632	65	434	88	6,560	579	7,139	686	6,107	989	7,096	787
Mississippi	306	24	206	30	3,626	215	3,841	770	3,360	181	3,541	602
Missouri	502	80	291	66	5,172	251	5,423	1,173	5,275	300	5,575	989
Montana	102	11	85	11	825	427	1,252	220	911	447	1,358	194
Nebraska	472	18	401	30	4,077	205	4,282	343	4,418	342	4,760	315
Nevada	4	12	6	22	79	3	82	224	123	11	134	237
New Hampshire	14	5	9	14	150	.....	150	162	145	1	146	125
New Jersey	24	42	18	41	359	6	365	804	306	9	315	726
New Mexico	16	15	10	26	396	24	420	370	436	27	463	349
New York	230	57	213	73	2,825	105	2,930	1,460	2,736	144	2,880	1,181
North Carolina	321	104	215	59	4,533	51	4,584	1,257	3,945	77	4,022	928
North Dakota	242	11	205	30	2,543	858	3,401	277	2,421	1,141	3,562	267
Ohio	522	103	388	78	5,744	353	6,097	2,154	4,576	428	5,004	1,751
Oklahoma	153	59	204	58	2,748	255	3,003	894	3,384	462	3,846	781
Oregon	83	53	93	39	1,336	87	1,423	637	1,284	101	1,385	574
Pennsylvania	233	99	167	135	2,781	31	2,812	2,017	2,407	47	2,454	1,563
Rhode Island	1	6	1	6	26	.....	26	68	26	.....	26	47
South Carolina	165	47	95	28	1,871	33	1,904	613	1,805	46	1,851	504
South Dakota	213	15	170	7	2,518	274	2,792	208	2,352	360	2,712	185
Tennessee	343	55	209	52	4,558	91	4,649	1,123	3,881	83	3,964	931
Texas	584	254	603	254	8,754	415	9,169	4,439	10,143	641	10,784	4,508
Utah	50	30	40	55	619	16	635	480	693	18	711	514
Vermont	29	7	22	4	386	4	390	96	394	10	404	75
Virginia	168	55	126	71	2,568	10	2,578	1,081	2,495	21	2,516	769
Washington	114	125	116	53	1,577	194	1,771	1,083	1,649	202	1,851	877
West Virginia	26	39	30	24	598	.....	598	398	594	.....	594	296
Wisconsin	485	43	442	55	5,473	160	5,633	785	5,768	282	6,050	769
Wyoming	19	19	26	18	357	25	382	231	419	43	462	263
Alaska	4	4	8	2	20	.....	20	56	27	1	28	40
Hawaii	3	2	2	3	70	6	76	92	52	4	56	106
U.S. Government	2	28	16	18	48	3	51	957	155	.....	155	565
Miscellaneous‡	2	.....	1	78	87	3	90	1,316	45	4	49	1,630
TOTAL	**10,856**	**2,599**	**9,007**	**2,606**	**130,863**	**8,744**	**139,607**	**46,619**	**127,535**	**11,455**	**138,990**	**41,136**

Data released Feb. 21, 1980, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; Hy-Dynamics; International Harvester; JCB Excavators, K-D Mfg.; Long; Massey-Ferguson; Pettibone; R. M. Wade (Satoh); Steiger; Versatile; White; and Woods & Copeland.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government.

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-Dec., 1978 and 1979 (1)

(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled				Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
							Power Units		Total Heads					
	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979	1978	1979
Alabama	539	504	161	107	378	252	1	1	1	1	220	231	64	63
Arizona	47	35	10	5	36	43	77	63	82	69	7	4	10	16
Arkansas	1,045	1,123	6	11	524	427	2	2	1	1	65	62	21	28
California	253	237	75	65	210	244	302	300	322	327	6	15	84	80
Colorado	249	316	132	166	422	507	257	284	257	289	54	70	162	195
Connecticut	1	2	2	1	76	67	1	.....	1	.....	1	2	40	68
Delaware	50	55	40	37	34	18	3	.....	3	.....	7	12	14	15
Florida	165	148	93	76	140	113	.....	3	.....	3	69	64	34	26
Georgia	725	764	575	532	365	244	5	1	5	1	520	542	139	133
Idaho	360	371	15	12	530	505	302	357	311	369	30	48	64	74
Illinois	3,600	3,305	3,549	3,533	414	399	30	15	30	15	748	679	354	365
Indiana	2,048	1,964	2,075	2,095	498	422	17	12	17	12	599	605	281	263
Iowa	3,665	3,474	3,866	4,191	486	459	265	262	272	257	1,893	2,062	954	930
Kansas	1,605	1,851	384	425	448	495	359	411	367	421	314	363	283	348
Kentucky	508	579	411	412	669	455	5	3	5	4	302	345	258	235
Louisiana	657	650	8	2	184	164	1	.....	1	.....	15	17	24	26
Maine	8	2	.....	.....	94	89	.....	3	.....	3	.....	1	36	63
Maryland	171	161	175	171	169	137	12	8	13	7	46	51	88	123
Massachusetts	.....	.....	1	.....	61	59	1	1	1	.....	4	1	32	38
Michigan	562	609	532	592	583	483	72	81	72	85	270	273	466	527
Minnesota	2,110	2,085	1,813	2,004	1,111	971	859	781	888	804	725	918	1,096	1,199
Mississippi	806	891	20	10	262	209	.....	.....	.....	.....	76	70	71	76
Missouri	1,575	1,676	868	939	751	685	92	87	96	89	583	667	205	217
Montana	456	393	1	5	464	413	569	511	624	551	65	87	68	48
Nebraska	1,738	1,845	1,605	1,816	278	257	457	518	474	525	522	633	428	486
Nevada	7	4	.....	.....	52	59	66	76	71	77	1	2	7	6
New Hampshire	.....	.....	.....	.....	55	59	1	1	1	1	.....	2	29	39
New Jersey	68	48	32	17	78	65	3	.....	3	.....	12	14	38	32
New Mexico	21	32	9	12	187	168	98	99	97	99	13	19	9	11
New York	171	179	204	287	882	812	83	74	85	74	174	133	913	1,054
North Carolina	591	662	544	530	569	327	2	3	2	3	252	257	143	141
North Dakota	1,182	1,383	67	86	145	96	1,063	922	1,130	986	124	194	144	155
Ohio	1,655	1,654	1,450	1,582	904	709	17	14	17	14	498	538	356	391
Oklahoma	461	620	22	15	743	907	152	168	155	172	141	187	39	61
Oregon	248	220	15	13	389	335	348	260	365	265	25	37	95	87
Pennsylvania	272	283	303	305	1,141	977	88	89	87	90	323	350	689	789
Rhode Island	.....	.....	.....	.....	6	6	.....	.....	.....	.....	.....	1	7	1
South Carolina	355	384	199	194	178	102	.....	.....	.....	.....	120	127	41	38
South Dakota	712	725	497	540	272	183	821	784	863	842	340	429	415	485
Tennessee	686	692	254	223	804	610	2	1	2	1	281	289	227	229
Texas	897	966	276	278	1,369	1,445	98	119	104	132	231	270	60	86
Utah	49	41	13	15	339	329	156	156	159	158	70	78	94	97
Vermont	.....	.....	2	.....	132	132	2	1	2	1	2	3	131	177
Virginia	216	259	181	221	610	488	9	7	9	7	145	165	283	259
Washington	328	381	24	71	367	348	187	213	191	226	29	20	130	104
West Virginia	4	3	5	6	373	265	.....	.....	.....	.....	32	36	56	58
Wisconsin	575	611	669	755	2,069	1,988	377	397	381	401	570	661	2,303	2,457
Wyoming	52	52	13	16	229	214	188	203	196	212	18	33	36	52
Alaska	.....	6	.....	.....	6	9	.....	.....	.....	.....	.....	.....	1	.....
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	.....
U.S. Government	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	6	.....	.....
TOTAL	**31,494**	**32,246**	**21,196**	**22,374**	**21,086**	**18,750**	**7,450**	**7,291**	**7,763**	**7,594**	**10,544**	**11,673**	**11,523**	**12,451**

Data released Feb. 21, 1980, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types 1978	Mower Conditioners All Types 1979	Manure Spreaders Conveyor-Type 1978	Manure Spreaders Conveyor-Type 1979	
264	242	20	18	Alabama
4	6	9	9	Arizona
520	574	101	115	Arkansas
54	49	69	86	California
125	166	42	71	Colorado
93	90	86	85	Connecticut
31	18	64	73	Delaware
141	124	28	30	Florida
340	279	36	51	Georgia
135	123	144	137	Idaho
782	773	1,128	916	Illinois
728	709	766	717	Indiana
1,501	1,480	2,409	2,391	Iowa
715	1,010	219	263	Kansas
1,235	1,217	303	316	Kentucky
118	126	21	26	Louisiana
115	121	116	119	Maine
174	182	242	230	Maryland
86	81	67	76	Massachusetts
949	786	828	824	Michigan
1,309	1,474	1,849	1,995	Minnesota
202	198	28	31	Mississippi
1,627	1,787	384	441	Missouri
137	129	64	50	Montana
462	623	442	549	Nebraska
3	12	7	7	Nevada
83	70	62	53	New Hampshire
97	80	58	63	New Jersey
38	38	3	8	New Mexico
1,258	1,265	1,732	1,649	New York
489	389	171	166	North Carolina
131	172	190	114	North Dakota
1,284	1,121	1,028	1,033	Ohio
705	960	29	36	Oklahoma
251	201	107	135	Oregon
1,329	1,252	1,367	1,429	Pennsylvania
6	6	3	1	Rhode Island
174	141	32	32	South Carolina
122	147	305	362	South Dakota
866	943	162	188	Tennessee
1,367	1,548	136	153	Texas
191	168	157	106	Utah
248	253	261	282	Vermont
676	762	247	261	Virginia
204	156	122	150	Washington
228	250	88	99	West Virginia
3,208	3,202	3,132	3,103	Wisconsin
151	74	47	54	Wyoming
1	2	1	1	Alaska
.....	1	.....	2	Hawaii
.....	.....	.....	.....	U.S. Government
.....	.....	1	1	Miscellaneous
24,957	**25,600**	**18,913**	**19,107**	**TOTAL**

March 21, 1980

NOTE

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April 7, 1980
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Implement&Tractor

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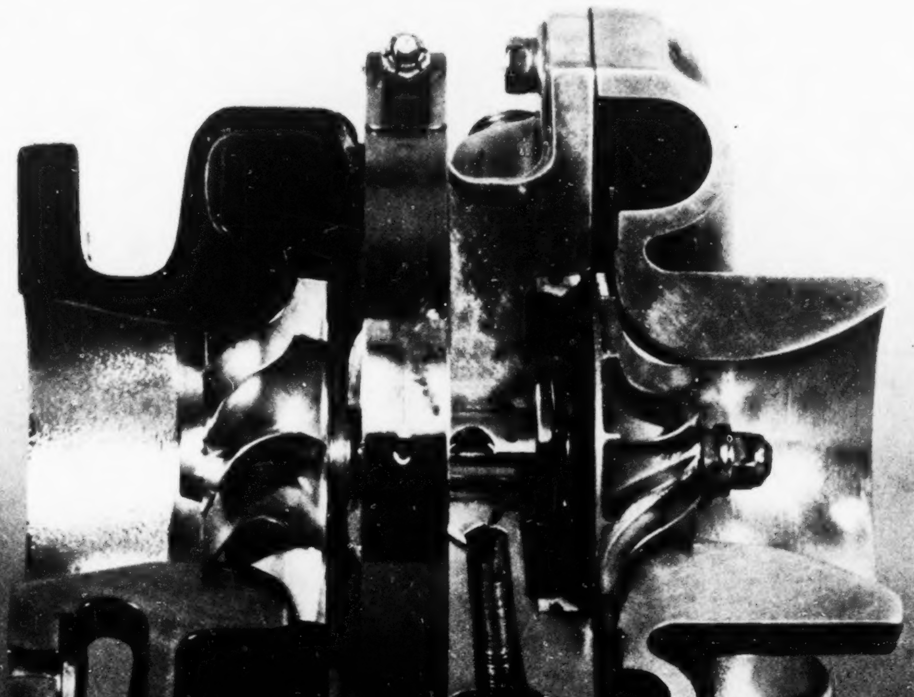

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April 7, 1980 • Vol. 95 • No. 9

Implement&Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

10: **White's Winter Huddle with Dealers Has Confident Air.** Bob Kidder, White's president, tells dealers about the company's very substantial increase in sales in 1979. Later, dealers examined White's product line-up and marketing plans for the year ahead.

12: **Farmers Feel the Pinch, Dealers Feel the Squeeze.** As spring approaches, two auctions, one in South Dakota, one in Iowa, show high demand for big used tractors in good condition; but the market is complicated by short supply, low farm income, high interest rates and worsening inflation.

26: **All About Turbocharging.** First of two parts explains what a turbocharger is, how it works, and the benefits of the process. (Cover photo courtesy M & W Gear Co.)

34: **Planting: an Ever-Changing Process.** Capsule reports on six research projects investigating new ideas and methods for more successful planting. Studies highlighted include double-cropping of soybeans, planting coated soybeans, no-till row-crop planting in wheat stubble, strip-till planting in dryland cereal, controlling planters by microprocessor, fighting soil crusting.

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what's ahead...

I&T
SINCE 1886

April 7, 1980

DEERE & CO. WILL INCREASE ITS WORLDWIDE OUTPUT BY 14 per cent (tonnage) in 1980, according to a statement to the Financial Analysts of Philadelphia by William A. Hewitt, chairman. For farm equipment in North America, according to Deere's president, Robert A. Hanson, there will be an "all-out" production effort to increase manufactured tonnage to 16 per cent "because of strong demand for Deere equipment and the very low inventories of major products such as tractors and combine harvesters."

FARM EQUIPMENT RETAIL SALES IN THE U.S. THROUGH FEBRUARY generally were showing a downward trend, according to the Farm & Industrial Equipment Institute flash report. Sales of two-wheel-drive tractors were off by 12.7 per cent, partly attributable to International Harvester Co. experiencing a strike throughout the U.S. during those months.

	Unit Retail Sales					
	February			January-February		
Equipment	1980	1979	Pct. Change	1980	1979	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-100 hp	3,449	4,058	-15.0	8,088	8,840	- 8.5
Over 100 hp	3,702	4,192	-11.7	8,308	9,949	-16.5
Total 2-wheel drive	7,151	8,250	-13.3	16,396	18,789	-12.7
4-wheel drive	586	552	+ 6.2	1,379	1,127	+22.4
Total Farm Tractors	7,737	8,802	-12.1	17,775	19,916	-10.8
Combines (S-P)	991	703	+41.0	2,426	2,408	+ 0.7
Balers *	323	493	-34.5	746	1,302	-42.7
Forage Harvesters **	266	197	+35.0	623	513	+21.4
Mower-Conditioners	564	574	- 1.7	1,270	1,514	-16.1

* Bales under 200 lbs. ** Shear-bar type.

HOW LONG WILL FARMERS KEEP MAJOR FARM EQUIPMENT ITEMS? A study made last year for the National Farm & Power Equipment Dealers Assn. by its Task Force for the Future said that farmers plan to keep their large tractors an average of eight years; 64 per cent will keep them longer than five years. Small tractors will be kept an average of nine years. Combines will be kept an average of seven years; 40 per cent of farmers will keep them from one to five years, 50 per cent, 6-10 years. Tillage equipment will be kept an average of nine years; planting equipment, eight years; forage harvesters, seven years. The Task Force advises dealers: "Farmers are keeping equipment longer as prices increase. They will be putting more money into parts and service to keep equipment running longer...for dealers to provide maximum service to their customers in the area of parts, they must have an efficient parts inventory program. One way to achieve this is through computerization. Dealers, to survive, must have access to a computer system to efficiently run their operations."

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I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO. Dothan, Alabama (February 12, 1980)

ALLIS-CHALMERS TRACTORS

7080 diesel, cab, 1975 (Excellent)	13,600*
7060 diesel, 1975 (Good)	7300*
220 diesel, duals, 1971 (Fair)	6000
200 diesel, 1973 (Rough)	3350
200 diesel, 1972 (Rough)	2950
190, LP, 1966 (Rough)	2700
170 diesel, 1968 (Fair)	3000
D15 diesel, 1962 (Fair)	600
WD, 1952 (Fair)	375*
B, 1940 (Fair)	375*
C, 1945 (Good)	500

CASE TRACTORS

1175 diesel, 1974 (Good)	6700*
1070 diesel, 1971 (Fair)	4800
1070 diesel, cab, 1971 (Good)	8200*
870 diesel, 1970 (Good)	4150
310, LP, 1958 (Rough)	225
DC, ldr., 1953 (Good)	475

DEUTZ TRACTOR

5506 diesel, 1974 (Good)	4500

DAVID BROWN TRACTORS

1410 diesel, 1976 (Excellent)	5950
990 diesel, 1967 (Fair)	1200
880 diesel, ldr., 1967 (Fair)	1200

MASSEY-FERGUSON TRACTORS

2805 diesel, cab, duals, 1976 (Good)	15,400
1155 diesel, cab, duals, 1976 (Good)	12,000
1130 diesel, 1968 (Fair)	3125
1105 diesel, cab, duals, 1977 (Good)	12,500*
1105 diesel, 1974 (Fair)	7500
1105 diesel, 1974 (Fair)	6900*
1085 diesel, 1977 (Good)	8100
1085 diesel, 1974 (Fair)	5500
285 diesel, 1976 (Good)	7600*
285 diesel, 1975 (Good)	7600
275 diesel, 1975 (Good)	6300*
265 diesel, 1976 (Good)	4600*
265 diesel, 1976 (Good)	4600*
235 diesel, 1975 (Good)	4000
235 diesel, 1975 (Excellent)	4800*
180 diesel, 1972 (Fair)	3200*
180 diesel, 1967 (Excellent)	4550
178 diesel, (Excellent)	4000
175 diesel, 1973 (Excellent)	5450
175 diesel, 1970 (Excellent)	5300
3165 diesel, 1967 (Good)	2800
3165 diesel, 1966 (Fair)	1500
165 diesel, 1970 (Good)	3300*
165 diesel, 1969 (Excellent)	4400
150 diesel, 1972 (Good)	3000
135 diesel, 1974 (Excellent)	3650
135 diesel, 1974 (Excellent)	3475
135 diesel, 1969 (Excellent)	3400
135, 1968 (Good)	3150
135, 1966 (Good)	2900
135, 1966 (Fair)	2350
135 diesel, 1965 (Good)	3150*
135 diesel, 1965 (Good)	3275
Sup. 90 diesel, 1962 (Good)	1650*
65 diesel, 1964 (Good)	2200
65 diesel, 1963 (Good)	2100*
50 diesel, 1963 (Good)	2000
50 diesel, 1962 (Excellent)	2300
50, 1960 (Good)	[illegible]
50, 1959 (Good)	1500*
35 diesel, 1962 (Excellent)	2450
35 diesel, 1959 (Good)	1450
35 diesel, 1959 (Fair)	1050
35, 1956 (Excellent)	2100*
35, LP, 1956 (Good)	1800
35, 1956 (Fair)	1200
35, 1956 (Good)	1825
30 diesel, 1973 (Excellent)	3800*
TO30, 1952 (Good)	1100
TO30, 1952 (Good)	1100*
TO30, 1952 (Good)	1200*
TO30, 1952 (Good)	1000
TO20, 1949 (Fair)	875*
TO20, 1949 (Good)	1200
TE20, 1948 (Fair)	725*

FORD-FERGUSON TRACTOR

9N, 1949 (Good)	950

FORD TRACTORS

9600 diesel, 1976 (Fair)	4700
8000 diesel, 1971 (Good)	5250
8000 diesel, 1969 (Good)	4650
8000 diesel, 1969 (Good)	5100
8000 diesel, 1969 (Good)	4850
7000 diesel, 1975 (Good)	5900*
7000 diesel, 1974 (Good)	5650
6700 diesel, 1976 (Excellent)	10,200
5000 diesel, 1974 (Good)	4550
5000 diesel, 1963 (Excellent)	6400*
5000 diesel, 1973 (Excellent)	5500
5000 diesel, 1972 (Good)	4750*
5000 diesel, 1971 (Excellent)	5600
5000 diesel, 1969 (Excellent)	5200
5000 diesel, 1969 (Excellent)	4900

5000 diesel, 1968 (Excellent)	5000*
5000 diesel, 1966 (Good)	4200
4000 diesel, 1970 (Excellent)	5200*
4000 diesel, 1968 (Good)	3100
4000 diesel, 1966 (Good)	3100
4000 diesel, 1966 (Fair)	2650
4000 diesel, 1966 (Rough)	2100
4000, 1966 (Fair)	2750
4000, 1966 (Good)	3350
4000, 1963 (Good)	2100*
4000 diesel, 1963 (Fair)	1450*
4000, 1963 (Good)	1850
3000 diesel, 1975 (Excellent)	4850
3000 diesel, 1972 (Good)	3325
3000 diesel, 1972 (Excellent)	4250
3000 diesel, 1971 (Excellent)	4350
3000 diesel, 1970 (Good)	3600
3000 diesel, 1969 (Fair)	2500
3000 diesel, 1968 (Fair)	2900*
3000 diesel, 1968 (Fair)	2850
3000 diesel, 1968 (Good)	3150
3000 diesel, 1966 (Fair)	2850
3000 diesel, 1966 (Fair)	2600*
3000, 1966 (Fair)	2450
3000, 1966 (Fair)	2450
3000, 1966 (Rough)	2250*
2000 diesel, 1974 (Excellent)	4200
2000 diesel, ldr., 1970 (Good)	3300
871 diesel, Select-O-Speed, 1958 (Good)	1100
860, 1957 (Good)	1700*
850, 1956 (Excellent)	2200
841 diesel, 1958 (Excellent)	2100
841 diesel, 1958 (Fair)	1300
641, 1961 (Excellent)	2200
641, 1960 (Rough)	1350
641, 1959 (Excellent)	2200
641, 1958 (Excellent)	2250
640, 1957 (Good)	1800
640, 1956 (Excellent)	2450
621, 1956 (Good)	2000*
Sup. Dexta, 1963 (Good)	1550
Sup. Dexta, 1963 (Good)	1550
Dexta, 1960 (Good)	1100*
NAA, 1954 (Good)	1750*
NAA, 1954 (Good)	1800*
NAA, 1954 (Fair)	1450
Jub., 1953 (Fair)	1550
Jub., 1953 (Rough)	875
8N, 1951 (Good)	1250
8N, 1949 (Excellent)	1600
8N, 1948 (Good)	1200
8N, 1948 (Good)	1400
8N, 1948 (Fair)	825
8N, 1948 (Fair)	875
8N, 1948 (Fair)	975
8N, 1948 (Good)	1250*
8N, 1948 (Good)	1300*
8N, 1948 (Fair)	775

HEFTY TRACTORS

G, (Excellent)	2750
G, (Good)	1400

INTERNATIONAL HARVESTER TRACTORS

1468 diesel, duals, 1974 (Fair)	6000*
1466 diesel, duals, 1972 (Fair)	8100
1066 diesel, 1974 (Good)	7150
856 diesel, 1968 (Good)	5500
826 diesel, 1970 (Good)	5400*
806 diesel, 1967 (Good)	3150
706 diesel, 1964 (Rough)	2350
706 diesel, 1963 (Excellent)	4400
674 diesel, 1974 (Good)	5200*
666 diesel, 1973 (Excellent)	6850
656 diesel, 1970 (Good)	4000
656 diesel, 1969 (Excellent)	5500
656 diesel, 1967 (Good)	4750*
656 diesel, 1966 (Fair)	3700
656 diesel, 1965 (Rough)	3200
544 diesel, 1968 (Rough)	1450
504, 1964 (Fair)	800
504 diesel, 1964 (Good)	1500
504 diesel, 1964 (Good)	1600
460 diesel, 1960 (Good)	750
2444 diesel, 1968 (Fair)	1300
2444, 1968 (Fair)	1300*
424 diesel, 1965 (Good)	1800
B414 diesel, 1960 (Good)	1250
404, 1964 (Good)	1450
340, 1960 (Good)	1750
330, backhoe, 1967 (Fair)	1000
300, 1955 (Good)	1050
MD, 1946 (Good)	400*
M, 1941 (Fair)	325
H, 1950 (Rough)	250
H, 1950 (Good)	450
Sup. C, mo. 1953 (Good)	750*
Sup. C, 1953 (Fair)	400
140, trencher, bld., 1967 (Good)	1700*
140, cult., plt., plow, 1960 (Fair)	1650*
154 Cub Loboy, mo., 1973 (Fair)	900
154 Cub Loboy, mo., 1970 (Good)	1650
154 Cub Loboy, 1968 (Good)	1700
Cub, mo., 1948 (Good)	1100*
Cub, 1948 (Good)	850
Cub, mo., 1948 (Fair)	875

JOHN DEERE TRACTORS

5020 diesel, 1968 (Good)	5600
4440 diesel, 1978 (Excellent)	26,500
4430 diesel, 1976 (Excellent)	13,250*
4230 diesel, cab, duals, 1975 (Excellent)	15,000
4020 diesel, 1970 (Good)	5500
4020 diesel, 1969 (Good)	6450
4020 diesel, duals, 1968 (Excellent)	7000*
4020 diesel, 1968 (Good)	5900
4020 diesel, 1968 (Rough)	3300
4020 diesel, 1965 (Fair)	3700*
4010 diesel, 1963 (Good)	4650
3020 diesel, 1970 (Good)	5800*
3020 diesel, 1967 (Good)	4400
3020 diesel, 1967 (Excellent)	5500*
3020 diesel, 1966 (Excellent)	5300
3020 diesel, 1965 (Good)	4000*
3020 diesel, 1964 (Good)	4600*
3010 diesel, 1963 (Fair)	2850
3010 diesel, 1962 (Good)	3450
3010 diesel, 1961 (Fair)	3100
2630 diesel, 1975 (Good)	5600
2630 diesel, 1975 (Good)	6000*
2030 diesel, 1974 (Good)	5400
2020 diesel, 1969 (Fair)	2700
2020 diesel, 1967 (Good)	3100*
1520 diesel, 1969 (Excellent)	4650
1020 diesel, 1966 (Good)	2800*
1020 diesel, 1966 (Good)	3300*
2010 diesel, 1963 (Good)	1625
1010, 1964 (Good)	2000
1010, 1964 (Good)	1500*
820 diesel, 1970 (Excellent)	3750
435 diesel, 1960 (Fair)	575
301 diesel, 1971 (Fair)	1050*
A, 1946 (Fair)	230

LONG TRACTORS

460 diesel, 1976 (Good)	3500*
445 diesel, 1973 (Good)	2600
384 diesel, 1971 (Good)	2650
384 diesel, 1971 (Fair)	2300

OLIVER TRACTORS

1650 diesel, 1965 (Good)	2900
1465 diesel, 1975 (Good)	3700*

(*More...*)

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Auctions

(continued)

D & L
IMPLEMENT, INC.
Mitchell, South Dakota
(February 7, 1980)

ALLIS-CHALMERS TRACTORS

D-17, 1960 (Good)	1500*
XT-190 diesel, 1967 (Good)	4150
WD 45, 1954 (Good)	700
XT-190 LP, 1965 (Good)	2500
XT-190 diesel, 1968 (Good)	3600*
5040, ldr., 1977 (Excellent)	6650
175 diesel, 1973 (Good)	6550
WD, 1952 (Fair)	175
7000 diesel, 1975 (Good)	12,600
7040 diesel, 1976 (Good)	13,800
170 diesel, 1971 (Good)	4750*

CASE-DAVID BROWN TRACTORS

630, 1964 (Fair)	610
630, 1964 (Good)	850
970 diesel, 1973 (Good)	8250
1370 diesel, 1974 (Good)	10,500
1030 diesel, 1968 (Excellent)	4900
930 diesel, 1967 (Fair)	2750*
2470 diesel, 1975 (Excellent)	14,500
990 diesel, 1968 (Fair)	1850
990 diesel, 1970 (Good)	2100*
1212 diesel, 1973 (Good)	5250

MASSEY-FERGUSON TRACTORS

TO-30, 1951 (Good)	850
TO-30, 1954 (Excellent)	1020
1085 diesel, 1977 (Excellent)	9875*
1185 diesel, 1975 (Good)	8500
1185 diesel, 1975 (Good)	9800
1500, 1972 (Good)	8050
1805, 1976 (Good)	15,250

JOHN DEERE TRACTORS

520, 1957 (Good)	1575
820 diesel, 1958 (Good)	1475
4020 diesel, 1969 (Good)	8850
4020 diesel, 1966 (Fair)	5950
4020 LP, 1967 (Good)	5250
4000 diesel, 1972 (Good)	9000
4520 diesel, 1969 (Good)	8500*
3010, 1961 (Good)	2750*
2510, 1967 (Good)	3100*
3010 diesel, 1962 (Good)	3750
3010, 1963 (Fair)	2500*
4010 diesel, 1962 (Good)	4900
4010, 1963 (Good)	2450*
3010, 1961 (Good)	2250*
5010 diesel, 1965 (Good)	3900
5020 diesel, 1967 (Fair)	5000
4620 diesel, 1972 (Good)	10,600
7020 diesel, 1973 (Good)	14,700*
350 crawler, 1968 (Good)	5200*

FORD TRACTORS

9N, 1948 (Fair)	500*
8N, 1948 (Good)	650*
8N, 1947 (Fair)	600
8N, 1949 (Good)	775
8N, 1950 (Good)	785
8N, 1948 (Fair)	490
8N, 1952 (Good)	850
8N, 1952 (Good)	950
8N, 1952 (Good)	920
Major diesel, 1961 (Good)	650*
600, 1961 (Good)	1300
900, 1958 (Good)	1175
7600, 1976 (Excellent)	8750
8600, 1973 (Good)	8400
4000, ldr., 1966 (Good)	2550
5000, 1969 (Good)	4550
6000 diesel, 1961 (Good)	1350

OLIVER TRACTORS

1850 diesel, 1968 (Good)	4450
1950 T, 1969 (Good)	4600*

MINNEAPOLIS-MOLINE TRACTORS

M-602 diesel, 1963 (Good)	1100*
Super 670 diesel, 1967 (Good)	2900*
A4T-1600, 1972 (Good)	7500
Super 670 diesel, 1969 (Good)	3875
G-1000 diesel, 1966 (Good)	2250*
950 LP, ldr., 1969 (Good)	5250
Super 670 diesel, 1965 (Fair)	2000
950 diesel, 1969 (Good)	4175

INTERNATIONAL HARVESTER TRACTORS

M, 1951 (Fair)	650
Super M, 1953 (Good)	950
M, ldr., 1950 (Good)	950*
M, 1950 (Fair)	725
C, 1953 (Good)	575
400, 1955 (Good)	1000*
W9, dozer, 1950 (Good)	1150*
460, 1960 (Fair)	1050*
400, 1954 (Good)	1100
560, 1961 (Fair)	1525
504, 1964 (Good)	1650
660 diesel, ldr., 1962 (Good)	1100*
706, 1965 (Good)	3250*
706, 1964 (Good)	3350
656 diesel, 1967 (Good)	4475
856 diesel, 1970 (Good)	6850
1026 diesel, 1971 (Good)	8250
1566 diesel, 1975 (Good)	9800
4166, 4WD, 1975, (Good)	9600*
T-6 crawler, 1963 (Good)	2250*
500-E crawler, 1977 (Excellent)	10,600

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

April 21, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

Implement & Tractor

FARM TRACTORS: WHERE HORSEPOWER WENT IN 1979 page 15

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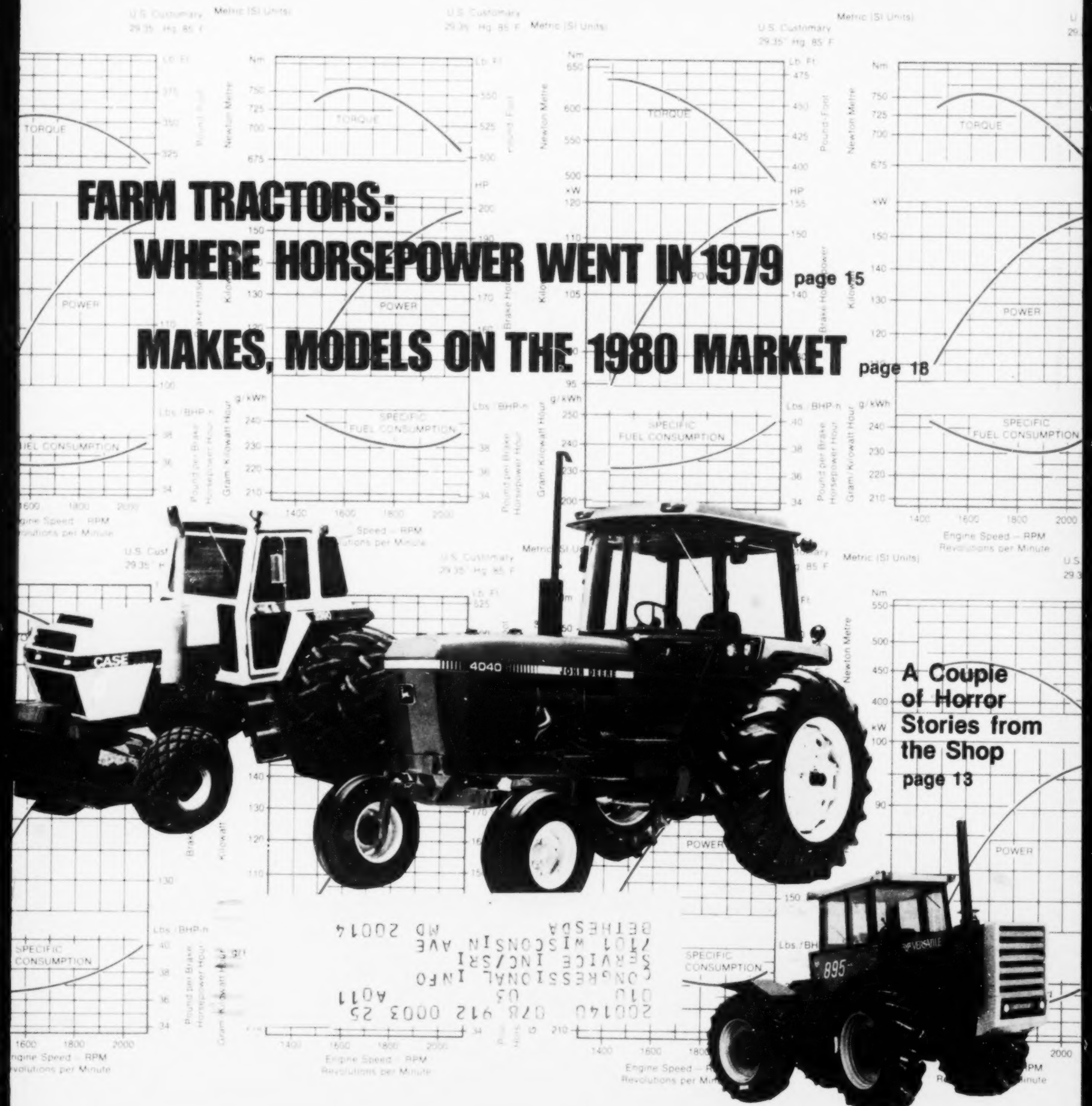
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Gram/Kilowatt Hour
Engine Speed — RPM
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INTERTEC PUBLISHING CORP.

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13: **Tales of Horror from the Shop.** A pair of chilling recitals of all that can go wrong to produce profit failures in the shop: poor communications, poor attitude, disorganization, inadequate repair equipment. (This, the first of a two-part series, is prologue to a more pleasant tale, coming soon, illustrating a profitable shop in action.)

15: **Where the Horsepower Went in 1979.** The bottom line for 1979 farm tractor sales isn't much different from the two years before, but there have been some evident shifts in popularity for certain horsepower categories.

18: **Makes and Models of Farm Tractors on the 1980 Market.**

32: **Turbocharging, Part 2.** The economics of turbocharging may be even more significant than the increased power it provides. Herein, Nebraska Test comparisons of turbocharged and naturally aspirated tractors.

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I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

BILL ENLOW TRACTOR SALES
Tulsa, Okla.
(February 8, 1980)

ALLIS-CHALMERS TRACTORS

HD-5 diesel, dozer, 1948 (Good)	2950*
D-14, plow, 1958 (Good)	1900*
190 diesel, 1965 (Good)	3900*
190 XT diesel, 1968 (Good)	4500
190 XT, 1968 (Good)	4600

CASE TRACTORS

885 diesel, 1979 (New)	6200*
1030 diesel, 1967 (Fair)	2750*
1030 diesel, 1968 (Good)	2975*
1070 diesel, 1972 (Good)	5900*

FERGUSON TRACTORS

20, 1948 (Good)	1250
20, 1950 (Good)	1330
30, 1952 (Good)	1390*
30, 1952 (Fair)	1020
30, 1953 (Fair)	1075
40, 1956 (Good)	2500
40, 1957 (Rough)	1000*

FORD TRACTORS

9N, 1940 (Rough)	875
9N, 1943 (Good)	1075
9N, 1943 (Good)	1100
9N, 1943 (Good)	1175
9N, 1945 (Good)	1150
9N, 1945 (Good)	1250
9N, 1945 (Good)	1250
9N, 1946 (Good)	1325
8N, 1947 (Fair)	1050*
8N, 1947 (Fair)	1050
8N, 1948 (Fair)	1000
8N, 1948 (Good)	1300*
8N, 1949 (Fair)	990
8N, 1949 (Good)	1380
8N, 1949 (Good)	1260
8N, 1949 (Good)	1375
8N, 1949 (Good)	1400
8N, 1950 (Fair)	1050*
8N, 1950 (Fair)	1175
8N, 1951 (Good)	1200*
8N, 1951 (Good)	1420
8N, 1951 (Good)	1350
8N, 1952 (Good)	1375
8N, 1952 (Good)	1700
8N, 1952 (Good)	1700
8N, 1952 (Good)	1520
8N, 1952 (Good)	1450
8N, 1952 (Good)	1300*
8N, 1952 (Good)	1550
8N, 1952 (Good)	1550
8N, 1952 (Good)	1450
8N, 1952 (Good)	1825
NAA, 1953 (Fair)	1575*
NAA, 1953 (Good)	1910
NAA, 1953 (Good)	1850
NAA, 1953 (Good)	1950
NAA, 1953 (Good)	1900
NAA, 1953 (Fair)	1675
NAA, 1953 (Good)	2050
600, 1957 (Good)	2200
640, 1956 (Good)	1825
640, 1955 (Fair)	1650
601, 1958 (Good)	2550
800, 1956 (Good)	2000
860, 1957 (Fair)	1800*
860, 1957 (Fair)	1750
860, 1957 (Good)	2125
801, 1958 (Good)	2150*
Fordson, 1958 (Rough)	1000
2000, 1962 (Good)	2500
2000, 1974 (Excellent)	4000*
3000, 1967 (Fair)	2400*
4000, 1963 (Good)	2100
4000 diesel, 1968 (Good)	4100*
4000 diesel, 1969 (Good)	3990*
4000 diesel, 1970 (Good)	4050*
4000 diesel, 1970 (Fair)	3000
4500 diesel, ldr., 1969 (Good)	3850*
4500 diesel, backhoe, 1971 (Good)	5750*
5000 diesel, 1965 (Good)	4000*
5000 diesel, 1967 (Fair)	3500*
5000 diesel, 1969 (Good)	4250*
5000 diesel, 1970 (Good)	4700*
5000 diesel, 1971 (Good)	5500
5000 diesel, Select-O-Speed, 1972 (Good)	3950*
5000 diesel, 1973 (Good)	6500

INTERNATIONAL HARVESTER TRACTORS

Cub Loboy, ldr., 1969 (Good)	2400*
B275 diesel, 1959 (Fair)	975
B414 diesel, 1964 (Good)	2450
560, 1960 (Fair)	650
3414 diesel, backhoe, 1967 (Good)	3200*
656 diesel, 1969 (Good)	4200*
806 LP, 1964 (Good)	1950
966 diesel, 1973 (Good)	8500*
1466 diesel, 1972 (Good)	8950

JOHN DEERE TRACTORS

B, 1944 (Good)	600
70, 1955 (Good)	1075
430 diesel, 1959 (Good)	1650
620, 1957 (Good)	900*
4010 LP, 1962 (Good)	3400
4010 LP, 1962 (Good)	3450
4010 diesel, 1963 (Good)	4600
4020 LP, 1964 (Good)	4500*
400 diesel, 1971 (Good)	5100
4440 diesel, 1973 (Good)	15,500

LONG TRACTOR

350 diesel, 1972 (Good)	3500*

MASSEY-HARRIS TRACTOR

444, 1958 (Good)	650*

MASSEY-FERGUSON TRACTORS

35, 1960 (Good)	1920*
35 diesel, 1963 (Good)	2450
50, 1962 (Fair)	1700
65, 1958 (Rough)	1450
65 diesel, 1959 (Good)	2200*
65 diesel, 1959 (Good)	2280*
65 diesel, ldr., 1960 (Good)	2400*
65 diesel, 1960 (Fair)	1900*
65, 1961 (Good)	1950
65 diesel, ldr., 1962 (Good)	2700*
65 diesel, 1962 (Good)	2250*
65 diesel, 1962 (Good)	2500*
65 diesel, 1963 (Fair)	1875
65 diesel, 1963 (Good)	2300*
65 diesel, 1963 (Good)	2350
65 diesel, 1964 (Good)	2475
65 diesel, 1964 (Good)	2950
65 diesel, 1964 (Good)	3150
135, 1964 (Good)	2950
135, 1966 (Good)	3075
135, 1968 (Good)	3300
135 diesel, 1968 (Good)	3325
150, 1968 (Good)	2700*
150 diesel, 1972 (Good)	3750
165 diesel, 1966 (Good)	3800*
165 diesel, 1966 (Good)	3680*
165 diesel, 1967 (Rough)	3000
165 diesel, 1967 (Fair)	3250
165 diesel, 1968 (Good)	3700
165 diesel, 1968 (Good)	3800
165 diesel, 1970 (Good)	4025*
165 diesel, 1970 (Good)	3975*
165 diesel, 1971 (Good)	4125
165 diesel, 1971 (Good)	4350
175 diesel, 1965 (Fair)	3500*
175 diesel, 1966 (Fair)	3600
175 diesel, 1968 (Good)	4175
175 diesel, 1970 (Good)	4600*
175 diesel, 1973 (Good)	5300
180 diesel, 1968 (Good)	3800*
180 diesel, 1969 (Good)	3900*
180 diesel, 1969 (Good)	3850
180 diesel, 1970 (Good)	4100*
1080 diesel, 1969 (Good)	4600
1080 diesel, 1973 (Good)	5900
230 diesel, 1978 (Good)	5000
230 diesel, bld., 1979 (Excellent)	5850*
230 diesel, 1979 (New)	6350
230 diesel, 1979 (New)	6400
245 diesel, 1977 (Good)	4950
245 diesel, 1978 (Excellent)	6000
245 diesel, 1979 (New)	7100
245 diesel, 1979 (New)	7050
245 diesel, 8-speed, 1980 (New)	7300
255 diesel, 1978 (Excellent)	7250
255 diesel, 1978 (Excellent)	7050*
265 diesel, 1977 (Good)	6800*
203 diesel, 1969 (Fair)	2400*
205, 1969 (Good)	2300
3165 diesel, ldr., 1970 (Good)	4450

MINNEAPOLIS-MOLINE TRACTORS

G-955 diesel, 1973 (Good)	5100
G-1000 LP, 1967 (Good)	3800*

NUFIELD TRACTORS

4/65 diesel, 1968 (Good)	2250
4/65 diesel, 1969 (Good)	2650

OLIVER TRACTORS

550, 1962 (Fair)	1350
1250 diesel, 1967 (Good)	2050
1250 diesel, 1968 (Good)	2300
1900, 1961 (Fair)	1950

YODER & FREY, INC.
Archbold, Ohio
(March 10, 1980)

ALLIS-CHALMERS TRACTORS

7050 diesel, 1974 (Good)	11,250*
210 diesel, 1969 (Good)	8600*
XT190 diesel, 1968 (Good)	6400*
XT190, 1967 (Fair)	6500
XT190 diesel, 1964 (Fair)	4400*
XT190, 1964 (Good)	2750*
180, 1966 (Good)	4250
160 diesel, 1966 (Fair)	2800*
D21, 1963 (Fair)	5500*
D19, 1963 (Good)	2425*
D19,	1575
D17 diesel, 1961 (Fair)	1725*
D15, 1963 (Good)	2000*
D15, 1960 (Rough)	1000
D14, 1960 (Fair)	1200*
D12, ldr., 1960 (Fair)	1300
WD45, ldr., 1952 (Good)	1250
WD45, 1952 (Fair)	1075
WD45, 1951 (Fair)	1000

DAVID BROWN TRACTORS

1212 diesel, 1972 (Fair)	5200*
1210 diesel, 1970 (Fair)	4400*
1200 diesel, 1961 (Fair)	2800*

CASE TRACTORS

1370 diesel, 1971 (Fair)	10,100*
1270 diesel, 1973 (Rough)	9400*
1170 diesel, 1970 (Fair)	7700*
1070 diesel, 1971 (Fair)	7800*
1030 diesel, 1963 (Fair)	3800*
930 diesel, 1964 (Good)	4625*
830 diesel, 1961 (Rough)	1500
830, 1959 (Fair)	1600*
530, plow, 1961 (Fair)	2750*

JOHN DEERE TRACTORS

8630 diesel, 1976 (Good)	29,000*
4630 diesel, 1975 (Fair)	16,300*
4630 diesel, 1974 (Good)	19,500*
4520 diesel, 1969 (Fair)	10,250
4520 diesel, 1969 (Rough)	8000*
4430 diesel, 1975 (Good)	17,700*
4430 diesel, 1973 (Fair)	13,000
4320 diesel, 1972 (Good)	12,100*
4320 diesel, 1972 (Good)	11,800*
4320 diesel, 1972 (Good)	11,100*
4320 diesel, 1972 (Good)	10,500*
4240 diesel, 1979 (Excellent)	25,500*
4030 diesel, 1976 (Good)	11,400
4020 diesel, 1968 (Good)	9800*
4020 diesel, 1965 (Good)	7100*
4020 diesel, 1965 (Fair)	6500*
4020 diesel, 1964 (Fair)	6300*
4010 diesel, 1963 (Good)	5500*
4010, 1963 (Good)	3875
3020 diesel, 1970 (Good)	6100*
3020 diesel, 1968 (Good)	5950
3020 diesel, 1969 (Fair)	5125
3020, 1966 (Good)	4150*
3020, 1964 (Good)	4450
3020, 1964 (Fair)	3500*
3010, 1962 (Fair)	2900*
3010, 1961 (Rough)	2475
2630, ldr., 1972 (Excellent)	8500*
2510, 1967 (Good)	3700
2510, 1967 (Good)	3650*
2240, ldr., 1978 (Excellent)	7950
2130, 1973 (Good)	6500
2030, 1955 (Excellent)	5000
2020, 1971 (Rough)	3800
2010, ldr., 1962 (Fair)	3200*
2010 diesel, 1962 (Fair)	1700
830 diesel, 1960 (Fair)	2400*
730 diesel, 1958 (Good)	2550*
730 diesel, 1957 (Fair)	1700*
720, 1956 (Fair)	1550*
720 diesel, 1956 (Fair)	1550
630, 1959 (Good)	2600
620, 1956 (Good)	2025*
530, 1959 (Rough)	1450
520, 1956 (Fair)	1575
430, 1958 (Good)	1600*
430, 1958 (Fair)	1450
70 diesel, 1954 (Good)	1800
40, 1955 (Good)	1275
A, 1951 (Good)	700
A, 1951 (Fair)	625

DEUTZ TRACTORS

130-06,	7500

130-06, 4WD	7400*
100-06, 1972 (Fair)	3100

FERGUSON TRACTORS

30, 1950 (Rough)	1040
TO20, 1950 (Good)	1150

FORD TRACTORS

9600 diesel, 1971 (Fair)	10,650
8000 diesel, 1972 (Fair)	7700*
5000, 1970 (Fair)	4500*
5000, ldr., 1968 (Rough)	4500*
5000 diesel, 1967 (Good)	5300*
5000 diesel, 1967 (Fair)	5100*
5000, plow, duals, 1966 (Fair)	4400
4000, ldr., 1965 (Fair)	4250*
4000, backhoe, ldr.,	3150
4000, ldr., 1958 (Fair)	1850*
3000, 1969 (Fair)	2875
2110, bld.,	2800
2000 diesel, 1968 (Fair)	2050
2000, ldr., 1965 (Fair)	2900*
1600, (New)	4450*
960, 1956 (Fair)	1500
860, 1960 (Fair)	1725
800, 1954 (Fair)	1625
Sup. Maj., 1956 (Fair)	1125
Jub., ldr., 1953 (Fair)	1400
8N, 1952 (Fair)	1350
8N, 1952 (Fair)	1310
8N, 1951 (Fair)	1200
8N, 1950 (Fair)	1275
8N, ldr., 1950 (Fair)	1250
8N, 1948 (Fair)	1075
9N, 1946 (Fair)	950

INTERNATIONAL HARVESTER TRACTORS

4166 diesel, (Fair)	13,250*
4100 diesel, 1970 (Fair)	6750
1486 diesel, 1978 (Excellent)	21,300*
1466 diesel, 1974 (Good)	11,500*
1466 diesel, 1974 (Good)	10,200
1466 diesel, 1974 (Fair)	10,100*
1466 diesel, 1973 (Good)	11,900
1466 diesel, 1973 (Fair)	9750*
1456 diesel, 1971 (Fair)	9000*
1256 diesel, 1969 (Good)	7800
1256 diesel, 1969 (Fair)	7300*
1066 diesel, 1973 (Good)	10,300*
1066 diesel, 1973 (Fair)	9400*
1066 diesel, 1973 (Good)	9350*
1066 diesel, 1973 (Rough)	7700
966 diesel, 1971 (Good)	11,100*
856 diesel, 1969 (Fair)	8100*
856 diesel, 1968 (Good)	7100*
826 diesel, 1970 (Good)	9200*
806 diesel, 1966 (Good)	6550
806 diesel, 1965 (Good)	5500*
806, 1964 (Fair)	4100
806 diesel, 1964 (Fair)	3750
806, 1964 (Fair)	3600
706, 1964 (Fair)	3250
706 diesel, 1962 (Rough)	2600*
606, 1962 (Fair)	1850
560 diesel, 1961 (Fair)	2450
560, 1960 (Fair)	2400*
560, 1960 (Fair)	1775
454, 1975 (Good)	4300*
454, 1973 (Good)	4500
400, 1956 (Fair)	950
350, ldr., 1956 (Good)	1950
300, 1955 (Fair)	1085
300, 1955 (Rough)	975
MTA, 1954 (Fair)	1425
M, 1952 (Good)	900
M, 1950 (Good)	870
H, 1950 (Fair)	450
H, ldr., (Fair)	520
Cub 185, mo., 1972 (Good)	2650
Cub 154, mo., 1965 (Good)	2125
Cub 154, mo., 1965 (Good)	2025

MASSEY-FERGUSON TRACTORS

205-4, (New)	4200*
1800, 1975 (Good)	11,500*
1800 diesel, 1975 (Fair)	9500*
1150, duals, 1969 (Good)	8750*
1135 diesel, 1977 (Good)	12,000*
1130 diesel, 1971 (Fair)	6200*
1100, 1965 (Fair)	3350*
1080 diesel, 1967 (Good)	4750
255, 1977 (Good)	5750*
180 diesel, 1968 (Good)	3500
165, 1966 (Fair)	3300*
165, 1961 (Fair)	3200*
135, 1968 (Good)	3250
Sup. 90, 1958 (Fair)	1600*
65, ldr., 1960 (Fair)	2825*
65, 1960 (Fair)	1560
50, 1962 (Fair)	1675
50, 1957 (Fair)	1250
35, ldr., 1960 (Good)	2950
35, ldr., 1956 (Fair)	2275

OLIVER TRACTORS

G1355 diesel, 1975 (Good)	11,100
1850 diesel, 1966 (Good)	4775
1850 diesel, 1964 (Fair)	4700*
1800, 1961 (Good)	2800
1800, 1961 (Fair)	2550*
1650, 1966 (Fair)	3375
1600, 1962 (Fair)	2750

WHITE TRACTOR

2-155, 1979 (Excellent)	22,750*

NOTES
Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

NOTE

ONLY THE FOLLOWING PAGES OF THIS PUBLICATION

HAVE BEEN FILMED

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WHERE FARM TRACTOR HORSEPOWER WENT IN 1979

By Bill Fogarty

LOVERS of baseball statistics don't mind when others deride them for combing the box scores or looking up averages in yearbooks and encyclopedias. They know that each one of those numbers stacked beside various names, abbreviations and symbols represents real, live base hits, strikeouts, stolen bases, double plays. With good numbers, you can trace a player's season or career through all its ups and downs. It's sort of like being there.

Did you know there are also lovers of farm equipment statistics? Far from being dry, dull, unimaginative people, they (we) know and appreciate the action, struggle and change these numbers represent. It, too, is like being there.

The recent arrival from the Farm & Industrial Equipment Institute of its complete 1979 report on retail sales activity provided us with a chance to examine some of the changes going on in the area of farm tractor sales.

Actually, the bottom line of the 1979 tractor sales report doesn't look vastly different from those of the two previous years (*i.e.*, since FIEI stopped public reports of under-40-hp unit sales): 138,990 tractors sold in 1979; 139,607 sold in 1978; 130,912 sold in 1977.

Four-wheeler changes

The four-wheel-drive market has changed in more ways than one in recent years. Sales slumped from 1976's 10,511 to 7,687 in 1977, were at 8,744 in 1978 and rebounded to a new high of 11,455 in 1979. In addition to this up-and-down movement, we had substantial horizontal action.

Sales of these tractors have always been substantial in Great Plains areas such as North Dakota and Montana, but now they are substantial and rising in places like Iowa, Indiana, Ohio and Wisconsin. The major thrust of the 1979 sales increase was in the under-200-horsepower category.

When four-wheel-drive tractor sales were suffering in 1977 and 1978, manufacturers were laboring to hold inventories down in this area particularly. (Consider what it costs a manufacturer to have, say, 1,000 big tractors in inventory, each having cost $30,000 to build. With real interest rates at around 20 per cent, that would cost $6 million!) Year-end stocks of four-wheelers over the past four years were:

(*More...*)

Farm Tractor HP

(continued)

1976—4,998; 1977—5,538; 1978—4,723; 1979—6,098. As with sales, last year's buildup was most notable in the under-200-hp category.

Industry watchers we have talked to attribute much of this movement to International Harvester's introduction in early 1979 of its "2+2" series of four-wheel-drive tractors, the 3388 and 3588.

Two-wheeler changes

When I&T began reviewing shifts in sales volumes from one horsepower bracket to another among two-wheel-drive tractors, we were drawn to the amount of movement in recent years within the 100- to 140-horsepower area.

From 1976 through 1979, tractor sales in this range didn't vary much, running from about 43,300 to 41,000 units. And tractor sales in the 100-119 horsepower bracket stayed at 15,000 to 16,000 annually.

But the 120-129-hp bracket has been vacated quite drastically! It counted for 20,000 sales in 1976, 12,700 in 1977—and then less than 4,000 in 1978 and 1979. Correspondingly, the 130-139-hp bracket became vastly more significant. Volume went from 6,400 in 1976 to 14,000 in 1977, to 23,800 in 1978 and 22,000 in 1979.

What happened? Did farmers make a massive leap ahead in powering their operations? No. Farmers' increases in horsepower are, nationally, a very gradual affair. Rather, International Harvester in late 1976 introduced its 1086 at 131 pto horsepower, replacing the 1066 (126 hp). Twelve months later, Deere & Co. introduced the 4440 (131 hp) succeeding the 4430 (126 hp).

We mention it to demonstrate the significant impact that these

(Continued on page 26)

Turn page for:
FARM TRACTORS Makes & Models on the 1980 North American Market

State	40-49	50-59	60-69	70-79	80-89	90-99	100-119
Alabama	717	361	272	136	285	54	264
Arizona	75	36	56	46	74	26	113
Arkansas	848	407	301	69	141	23	126
California	668	794	1,045	490	487	84	329
Colorado	101	79	94	28	62	20	98
Connecticut	34	37	52	17	15	5	12
Delaware	26	35	48	4	25	.....	35
Florida	403	288	522	248	298	60	181
Georgia	761	330	409	212	319	67	301
Idaho	70	102	138	33	139	31	163
Illinois	311	310	477	319	393	78	808
Indiana	273	301	362	195	346	35	521
Iowa	147	215	619	382	654	159	1,562
Kansas	127	118	217	131	225	89	616
Kentucky	1,130	959	671	336	448	60	240
Louisiana	536	241	272	92	106	21	125
Maine	50	51	41	9	22	5	33
Maryland	161	105	125	42	85	31	114
Massachusetts	26	43	41	9	9	7	6
Michigan	332	364	426	194	308	79	392
Minnesota	126	245	742	321	625	136	1,150
Mississippi	611	332	272	128	252	23	203
Missouri	566	582	697	334	519	106	581
Montana	55	75	113	48	109	21	139
Nebraska	44	61	169	67	265	119	880
Nevada	13	21	15	3	19	1	13
N. Hampshire	55	38	24	5	7	4	5
New Jersey	68	50	47	18	51	3	23
New Mexico	86	46	27	21	23	6	62
New York	330	351	577	203	423	85	394
North Carolina	1,092	538	513	255	513	68	306
North Dakota	33	45	70	42	85	30	371
Ohio	519	498	594	246	470	88	613
Oklahoma	569	251	246	99	225	68	453
Oregon	313	259	167	64	114	26	116
Pennsylvania	340	375	489	144	376	65	316
Rhode Island	10	6	5	1	2	1	1
South Carolina	455	228	214	148	173	27	133
South Dakota	22	43	135	58	159	59	587
Tennessee	1,026	622	429	220	337	50	270
Texas	1,990	985	934	482	732	101	788
Utah	84	141	121	29	99	18	93
Vermont	39	75	100	31	73	5	31
Virginia	742	415	358	140	299	45	218
Washington	510	458	205	47	120	29	79
West Virginia	257	153	94	20	40	5	15
Wisconsin	206	479	1,167	498	852	125	1,063
Wyoming	26	57	52	21	54	12	67
Alaska	7	13	3	.....	1	.....	.....
Hawaii	25	8	7	3	1	3	3
U.S. Government	29	.....	14	102	.....	7	2
Miscellaneous	11	6	.....	.....	1	5	8
TOTAL	**17,055**	**12,632**	**14,788**	**6,790**	**11,460**	**2,275**	**15,022**

1979 Retail Sales of Farm Wheel Tractors by PTO Horsepower and State

(in units)

Two-Wheel-Drive Tractors							Four-Wheel-Drive Tractors					
120-129	130-139	140-149	150-159	160-179	180 & over	Total 2-Wheel Drive	Under 200	200-249	250 & over	Total 4-Wheel Drive	All Farm Wheel Tractors	State
40	285	50	81	51	58	2,654	16	20	12	48	2,702	Alabama
16	87	17	52	24	65	687	23	64	23	110	797	Arizona
62	495	209	372	227	428	3,708	58	196	51	305	4,013	Arkansas
63	296	48	140	95	136	4,675	111	222	80	413	5,088	California
25	233	46	104	47	72	1,009	77	78	29	184	1,193	Colorado
1	10	2	1	1	.....	187	2	.....	.....	2	189	Connecticut
11	31	3	7	5	6	236	5	11	3	19	255	Delaware
18	132	17	30	25	25	2,247	29	57	8	94	2,341	Florida
90	633	123	164	91	163	3,663	7	31	16	54	3,717	Georgia
56	189	53	75	20	14	1,083	63	87	30	180	1,263	Idaho
241	1,858	428	568	439	490	6,720	404	388	139	931	7,651	Illinois
154	1,046	224	291	260	270	4,278	235	231	106	572	4,850	Indiana
348	2,732	741	546	398	364	8,867	408	311	85	804	9,671	Iowa
286	1,095	200	379	318	361	4,162	285	321	56	662	4,824	Kansas
37	260	29	73	52	74	4,369	52	48	10	110	4,479	Kentucky
38	227	178	205	173	312	2,526	60	112	32	204	2,730	Louisiana
1	14	.....	1	.....	.....	227	2	.....	.....	2	229	Maine
17	66	19	13	9	13	800	17	14	11	42	842	Maryland
.....	2	.....	1	.....	.....	144	.....	.....	.....	.....	144	Massachusetts
75	491	75	80	78	65	2,959	154	112	31	297	3,256	Michigan
238	1,520	278	318	234	174	6,107	530	361	98	989	7,096	Minnesota
53	438	137	358	232	321	3,360	36	85	60	181	3,541	Mississippi
208	878	185	238	178	203	5,275	122	127	51	300	5,575	Missouri
51	150	19	57	31	43	911	178	193	76	447	1,358	Montana
215	1,418	394	359	218	209	4,418	164	138	40	342	4,760	Nebraska
.....	20	.....	12	2	4	123	7	2	2	11	134	Nevada
.....	5	.....	.....	1	.....	145	1	.....	.....	1	146	N. Hampshire
4	23	7	3	6	3	306	8	.....	1	9	315	New Jersey
6	93	9	21	16	20	436	11	14	2	27	463	New Mexico
45	243	33	24	17	11	2,736	99	34	11	144	2,880	New York
57	287	82	77	66	91	3,945	34	25	18	77	4,022	North Carolina
188	749	204	238	172	194	2,421	477	517	147	1,141	3,562	North Dakota
144	768	187	133	155	161	4,576	213	163	52	428	5,004	Ohio
147	752	92	172	176	134	3,384	180	247	35	462	3,846	Oklahoma
22	112	24	35	22	10	1,284	57	30	14	101	1,385	Oregon
46	180	24	17	24	14	2,407	30	13	4	47	2,454	Pennsylvania
.....	.....	.....	.....	.....	.....	26	.....	.....	.....	.....	26	Rhode Island
29	192	40	56	39	71	1,805	18	17	11	46	1,851	South Carolina
142	681	131	156	112	67	2,352	205	123	32	360	2,712	South Dakota
55	409	81	131	93	158	3,881	23	31	29	83	3,964	Tennessee
262	1,881	493	502	481	512	10,143	243	302	96	641	10,784	Texas
16	57	10	13	7	5	693	8	8	2	18	711	Utah
5	23	7	.....	5	.....	394	10	.....	.....	10	404	Vermont
29	157	25	20	20	27	2,495	7	8	6	21	2,516	Virginia
7	112	10	49	12	11	1,649	71	98	33	202	1,851	Washington
3	6	.....	1	.....	.....	594	.....	.....	.....	.....	594	West Virginia
185	736	158	111	85	103	5,768	183	68	31	282	6,050	Wisconsin
17	76	11	13	8	5	419	20	16	7	43	462	Wyoming
1	.....	.....	.....	2	.....	27	.....	1	.....	1	28	Alaska
.....	.....	1	1	.....	.....	52	.....	.....	4	4	56	Hawaii
.....	1	.....	.....	.....	.....	155	.....	.....	.....	.....	155	U.S. Government
.....	7	2	3	1	1	45	1	2	1	4	49	Miscellaneous
3,754	**22,156**	**5,106**	**6,301**	**4,728**	**5,468**	**127,535**	**4,944**	**4,926**	**1,585**	**11,455**	**138,990**	**TOTAL**

DATA: Farm & Industrial Equipment Institute. Figures do not include garden tractors, motor tillers, or contractor's off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland, Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; International Harvester; Long; Massey-Ferguson; Rome Industries; Steiger; Versatile; R. M. Wade (Satoh); and White. Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Farm Tractor HP

(Continued from page 16)

two companies have on the U.S. market for big tractors.

Power alley

The farm tractor industry is certainly a global one and most manufacturers are hopeful of getting at least a toehold in all the markets of the world. But if one focuses on the big tractor market, *i.e.*, where tractors of over 100 horsepower are sold, an amazingly compact area soon becomes apparent.

Last year, according to the FIEI data, 73,990 tractors of over 100 hp, both two-wheel and four-wheel-drive types, were sold in the U.S., and over 58 per cent of them were bought by farmers in 10 states. About 38 per cent of them were sold in five states.

The 10 states and their 1979 sales totals on farm tractors of 100 horsepower and more are:

Iowa—7,495; Illinois—5,763; Texas—5,560; Minnesota—5,001; Nebraska—4,035; Kansas—3,917; Indiana—3,438; Missouri—2,771; Wisconsin—2,723; Ohio—2,589. □

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industry in motion

Stanley O. Eaton has been named general manager of the **Allis-Chalmers Corp. Implement Div.**, which includes plants in LaPorte, Ind., and Oxnard, Calif.

Lewis S. Armstrong, president, **Lockwood Corp.**, Gering, Neb., has announced the appointment of Eugene J. Haupt as vice-president, engineering.

Danny Sibley has been appointed chief engineer at **Amco Products**, Yazoo City, Miss.

Vicon Farm Machinery, Inc., Chesapeake, Va., is preparing to unveil a new line of farm equipment in August, according to a Vicon spokesman. "It represents a new dimension in farm machinery," he asserted.

Austin Products, Inc., Dallas, Texas, has named James P. Spalding to the position of vice-president, distribution. Previously, he was materials manager with the Athens Plow Div. of Austin and assistant to the president.

Dewey Pry has been named manager of the midwest branch for **Long Mfg. N.C. Inc.**, according to Charles Gregory, executive vice-president and general manager. Pry has been with Long since 1971 and was previously sales manager of the midsouth branch in Memphis, Tenn. Long's midwest branch is located in Davenport, Iowa.

Mark S. Denton has been named director of marketing for **Pierce Corp.**, a manufacturer of irrigation systems and fittings, headquartered in Eugene, Ore.

Mike Arkell has joined **Neapco, Inc.**, Pottstown, Pa., as national sales manager, Automotive & Agricultural Aftermarket Div.

Use I&T's Handy Reply Card

May 7, 1980
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Serving the Farm and Industrial Equipment Industry Since 1886

Implement & Tractor

Dealership management succession

What an I&T survey reveals page 6

Here lies
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To set up a plan

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in the I&T Manufacturers Edition
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Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

6: **Dealership Management Succession.** An I&T survey of dealer subscribers shows about half are planning for the immediate family to carry on the business after they're gone. Most of the rest have other plans for business perpetuation, but we think we have good reason to wonder how many of these plans have a solid foundation.

16: **How Have IH Dealers Been Living with the Strike?** Though, in the large sense, all IH dealers we contacted were in the same boat, not all were suffering equally. Depending on geography and their state of preparedness last October, some were well-stocked six months later, some were empty-handed. But almost all were apprehensive, and all were consoled with the thought that the strikers were probably suffering as much or worse than themselves.

24: **Good (Profitable) Service Takes More Than Technical Know-How.** It takes the most modern repair equipment and tight organization all down the line: from the time the truck driver picks up a unit, to when the serviceman, parts and tools at hand, begins to apply his technical expertise.

44: **Shortliners in Spring,** rejoicing at sales so far in 1980, were bracing for a possible falling-off in the spring planting season. In the formal sessions of the FEMA Spring Management Clinic, shortliners brushed up on the whys and wherefores of employee compensation and learned a simple exercise for improving mental-physical coordination.

DEPARTMENTS

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(March 11, 1980)

ALLIS-CHALMERS TRACTORS

190 diesel, 1966 (Rough)	1300*
170 diesel, 1971 (Good)	3400
170 diesel, 1970 (Good)	3750
D17 LP, 1959 (Fair)	600
WD, 1952 (Fair)	350*
CA, cult., plt., plow, 1953 (Good)	925
C, cult., plow, 1948 (Good)	425*
C, 1944 (Rough)	200*
B, 1939 (Fair)	375*

CASE TRACTOR

770 diesel, 1970 (Good)	5000

DAVID BROWN TRACTORS

995 diesel, 1975 (Good)	3525
990 diesel, 1968 (Good)	1875
990 diesel 1968 (Good)	2000

MASSEY-FERGUSON TRACTORS

1155 diesel, 1973 (Good)	11,300
1100 diesel, 1967 (Good)	4650
1085 diesel, cab, 1976 (Good)	6700*
1085 diesel, 1974 (Good)	6450
1080 diesel, 1972 (Good)	3900
255 diesel, 1976 (Excellent)	6500
255 diesel, 1976 (Good)	5500
235 diesel, 1975 (Good)	4400*
230 diesel, 1975 (Good)	4300
220, ldr., (Good)	2900*
180 diesel, 1968 (Fair)	3025
175 diesel, 1971 (Good)	4350
175 diesel, 1966 (Good)	3950*
165 diesel, 1973 (Good)	3800
165 diesel, 1970 (Fair)	3250*
165 diesel, 1968 (Rough)	1850
165 diesel, 1968 (Good)	3200
165 diesel, 1966 (Good)	3500*
135 diesel, 1970 (Good)	3100
135 diesel, 1967 (Good)	3500
135 diesel, 1967 (Good)	3000
135 diesel, 1967 (Fair)	2500
135 diesel, 1966 (Good)	2800
135 diesel, 1966 (Fair)	2450*
135, 1966 (Good)	3100
135 diesel, 1966 (Good)	3150*
65 diesel, 1963 (Good)	2150
50, 1960 (Good)	2500
50, 1958 (Good)	2000
40, backhoe, ldr., 1970 (Good)	2700
35, 1963 (Good)	2000
35, 1961 (Excellent)	2650
35, 1957 (Good)	1600
35, 1955 (Excellent)	2300
35, 1955 (Fair)	1500*
30 diesel, 1970 (Good)	3100*
TO30, 1953 (Rough)	600
TO30, 1952 (Good)	1150*
TO30, 1952 (Good)	950*
TO20, 1950 (Good)	850
TO20, 1950 (Excellent)	1600

FORD-FERGUSON TRACTORS

9N, 1946 (Good)	750
9N, 1944 (Fair)	575

FORD TRACTORS

9600 diesel, duals, 1975 (Excellent)	8700
7000 diesel, 1975 (Excellent)	7700*
7000 diesel, 1972 (Good)	6750
5000 diesel, 1975 (Excellent)	5950
5000 diesel, 1972 (Good)	4900*
5000 diesel, 1971 (Good)	4900*
5000 diesel, 1970 (Good)	5000*
5000 diesel, 1970 (Good)	5000
5000 diesel, 1969 (Good)	4700*
5000 diesel, 1969 (Good)	4900*
5000 diesel, 1968 (Good)	4800*
5000 diesel, 1967 (Fair)	3400
5000 diesel, 1966 (Good)	3925*
5000 diesel, 1966 (Good)	3775
4000 diesel, 1974 (Good)	3500
4000 diesel, 1974 (Good)	4325
4000 diesel, 1970 (Good)	3300*
4000 diesel, 1967 (Fair)	2500*
4000 diesel, 1966 (Good)	3200*
4000, 1966 (Good)	3100*
4000, 1966 (Fair)	2700
4000, 1963 (Fair)	1500
4000, 1963 (Good)	2250*
4000 diesel, 1963 (Good)	2000
4000 diesel, Select-O-Speed, 1963 (Fair)	1600
3400, ldr., 1967 (Fair)	2300*
3000 diesel, 1971 (Good)	3600*
3000 diesel, 1970 (Excellent)	4700*
3000 diesel, 1969 (Good)	3700*
3000, 1967 (Good)	3075
3000 diesel, 1966 (Excellent)	3600
3000 diesel, 1966 (Good)	3100
3000, 1966 (Good)	3000*
2000 diesel, 1966 (Good)	2500
2000, ldr., 1963 (Excellent)	3200
2000, 1963 (Good)	2400*
2000, 1963 (Fair)	1500
851, 1958 (Fair)	1300
850, 1956 (Good)	1600
850, 1955 (Good)	2050*
850, 1955 (Good)	2150*
841 diesel, 1958 (Good)	1700
841 diesel, 1958 (Good)	1750
841, ldr., 1958 (Fair)	1900
841 diesel, 1958 (Excellent)	2300
841 diesel, 1958 (Good)	1925
660, 1957 (Good)	1900
641, 1961 (Excellent)	2925
641, 1960 (Good)	1900*

641, 1959 (Fair)	1200
641, 1959 (Good)	2000
641, 1958 (Good)	1750
640, 1956 (Good)	2150
640, 1956 (Good)	2150
640, 1955 (Good)	1700
640, 1955 (Good)	1750*
621, 1960 (Good)	2250
541, 1958 (Good)	1200
NAA, 1954 (Good)	1700
NAA, 1954 (Good)	1850
NAA, 1954 (Good)	1675*
Jub., 1953 (Good)	1500*
Jub., 1953 (Good)	1550
Jub., 1953 (Good)	1475*
Jub., 1953 (Good)	1500*
Jub., 1953 (Excellent)	2000
8N, 1951 (Excellent)	1650
8N, 1951 (Good)	950*
8N, 1951 (Excellent)	1650
8N, 1951 (Excellent)	1700
8N, 1949 (Rough)	675
8N, 1948 (Good)	1025*
8N, 1948 (Good)	1400
8N, 1948 (Good)	1050*
8N, 1948 (Good)	1150

INTERNATIONAL HARVESTER TRACTORS

1466 diesel, 1971 (Good)	8300
1066 diesel, 1974 (Fair)	5250*
1066 diesel, duals, 1973 (Good)	9000
1066 diesel, 1972 (Good)	8000
826 diesel, 1971 (Good)	6750
756 diesel, duals, cab, 1970 (Good)	5050
706 diesel, 1967 (Good)	3700*
706 diesel, 1965 (Good)	3400*
674 diesel, 1974 (Excellent)	6000*
674 diesel, 1973 (Good)	5100*
656 diesel, 1971 (Good)	4300
544 diesel, 1973 (Fair)	1650*
544 diesel, 1968 (Excellent)	3950
544, 1968 (Good)	2400*
504 diesel, 1962 (Good)	1075*
444 diesel, 1970 (Fair)	2300*
340, 1961 (Rough)	825
330, 1957 (Good)	900
300, 1955 (Fair)	400
M, 1946 (Fair)	300
H, 1946 (Good)	450
H, cult., plt., 1942 (Fair)	250
Sup. C, 1953 (Good)	825
140, cult., plt., plow, 1960 (Good)	1900*
100, cult., plt., 1955 (Good)	1700
Sup. A, cult., plow, 1950 (Fair)	1100*
154 Cub Loboy, mo., 1973 (Good)	1475*
Cub, cult., plt., plow, har., 1968 (Excellent)	4000
Cub, cult., plt., 1950 (Good)	1300
Cub, 1949 (Good)	950

JOHN DEERE TRACTORS

8630 diesel, duals, cab, 1976 (Good)	27,000*
4430 diesel, 1975 (Excellent)	16,100
5020 diesel, 1970 (Good)	6650
5020 diesel, 1967 (Good)	6000
4020 diesel, 1968 (Good)	5050
4010 diesel, 1962 (Good)	4200*
4010, 1962 (Excellent)	5000
4010 diesel, 1961 (Fair)	3350
4010 diesel, 1961 (Fair)	3475*
3020 diesel, 1968 (Good)	5300*
3020 diesel, 1966 (Good)	4150*
3020 diesel, 1965 (Good)	5200*
3010 diesel, 1961 (Fair)	2050
2240 diesel, 1976 (Good)	6700
2040, 1977 (Good)	4400*
2040 diesel, 1976 (Good)	4900*
2020, 1967 (Good)	3300
2010, 1963 (Good)	1500
1520, 1970 (Excellent)	4000
1020 diesel, 1972 (Excellent)	3575*
1020 diesel, 1970 (Good)	2950
1020, 1970 (Good)	2950
1020 diesel, 1969 (Excellent)	3675
1020, 1967 (Good)	2900*
1010, 1962 (Good)	1400
950 diesel, (Good)	4450
420, 1957 (Good)	1000
60, plow, 1954 (Good)	550
R, 1950 (Rough)	325
M, 1951 (Fair)	350

KUBOTA TRACTORS

B6000, cult., plt., plow, 1979 (Good)	2150
185, cult., plt., plow, har., 1979 (Excellent)	4200

LONG TRACTORS

550 diesel, 1977 (Good)	2450*
4/65 diesel (Good)	750
460 diesel, 1975 (Excellent)	4600
384 diesel, 1971 (Good)	2300
360 diesel, bld., 1978 (Good)	2000

MASSEY-HARRIS TRACTORS

50 LP, 1957 (Good)	1600*
44, 1951 (Rough)	150*

OLIVER TRACTORS

1850 diesel, 1967 (Good)	3650
1650 diesel, 1965 (Good)	3000
1465 diesel, 1975 (Good)	3900*
1365 diesel, 1972 (Good)	2250
1250, 1965 (Good)	1550*
550 diesel, 1959 (Fair)	750
55, 1956 (Fair)	700

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May 21, 1980
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S

E MOLDBOARD PLOW
ERY MUCH ALIVE

page 8

An I&T exclusive first: Moldboard Specifications

page 10

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INTERTEC PUBLISHING CORP.

May 21, 1980 • Vol. 95 • No. 12

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

8: **The Moldboard Plow—Still Destined for a Vital Role.** A spirited defense of a much-maligned implement. Author Frank Buckingham rebuts the critics who allege that the moldboard's use is irreconcilable with energy and soil conservation, and that farmers are rejecting it in ever-increasing numbers. On the contrary, says Buckingham, "plow power" has declined little if any over the past decade, and the moldboard is an effective, efficient and non-destructive tool when used intelligently.

10: **Moldboard Plow Specifications.** Exclusive with I&T, complete technical data on the four types: mounted, semi-mounted, pull-type and two-way.

22: **Plow Parts and Their Makers.** Who makes what: bottoms, coulters, jointers, trashboards, shares, moldboards, landsides, shins, frogs, frame parts, standard hardware.

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BEST AVAILABLE COPY

I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

YODER & FREY, INC.
Archbold, Ohio
(April 7, 1980)

ALLIS-CHALMERS TRACTORS

7050 diesel, 1975 (Good)	11,000*
7030 diesel, 1972 (Good)	9300*
5050, ldr., 1979 (Excellent)	9000*
210 diesel, 1971 (Fair)	8100*
XT190, 1967 (Fair)	6900
XT190 diesel, 1967 (Good)	6100*
XT190 diesel, 1967 (Fair)	5900*
XT190, 1966 (Fair)	4750*
160 diesel, 1967 (Rough)	2250*
D21, 1967 (Fair)	5750*
D19, 1967 (Fair)	2000*
D17, 1967 (Fair)	2750
D17 diesel, ldr., 1965 (Fair)	2500
D17 diesel, 1960 (Rough)	1450*
D17 diesel, 1960 (Rough)	1175
D15, 1967 (Fair)	1500*
WD45, 1956 (Fair)	1000
WD45, 1952 (Fair)	950

CASE TRACTORS

1270 diesel, 1971 (Good)	9950
1170 diesel, 1971 (Good)	6750*
1070 diesel, 1971 (Good)	7750
1030, 1963 (Fair)	3650*
970 diesel, 1962 (Good)	8500
930, 1964 (Fair)	4500*
930, 1962 (Fair)	3000
730 diesel, 1964 (Fair)	3325
730, 1963 (Fair)	2600*
730, 1963 (Fair)	1950
730 diesel, 1962 (Good)	1500
630, ldr., 1961 (Rough)	935
530, 1962 (Fair)	1850
530, ldr., 1961 (Good)	1650
430 diesel, 1961 (Fair)	2350

DAVID BROWN TRACTORS

1210, 1969 (Good)	4400
1200, 1970 (Fair)	2700*
990, 1962 (Fair)	1925

JOHN DEERE TRACTORS

8620 diesel, 1978 (Good)	28,250*
4630 diesel, 1975 (Good)	16,900
4440, 1979 (Excellent)	24,000*
4430 diesel, 1975 (Excellent)	16,000*
4430 diesel, 1974 (Good)	15,450
4430 diesel, 1974 (Rough)	12,400
4040 diesel, 1979 (Excellent)	16,600
4320 diesel, 1971 (Good)	10,300*
4320 diesel, 1971 (Fair)	9500*
4320 diesel, 1970 (Good)	11,100*
4320 diesel, 1970 (Good)	9750*
4240 diesel, 1979 (Excellent)	23,500*
4030 diesel, 1973 (Good)	9600
4000 diesel, 1971 (Fair)	8000
4000, 1968 (Good)	7350
4020 diesel, 1970 (Excellent)	9600
4020 diesel, 1970 (Good)	8500*
4020, 1970 (Good)	7000
4020 diesel, 1968 (Good)	7200
4020 diesel, 1967 (Fair)	5900
4020 diesel, 1966 (Good)	6500*
4020, 1966 (Good)	5550
4020 diesel, 1965 (Good)	7000
4020 diesel, 1965 (Fair)	5700
4020 diesel, 1964 (Good)	6500
4020 diesel, 1964 (Good)	6450
4020 diesel, 1964 (Rough)	5700
4010 diesel, 1962 (Fair)	4250
4010, 1962 (Fair)	3350
4010, 1961 (Fair)	3600
3020, 1967 (Good)	5800*
3020 diesel, 1966 (Fair)	5200*
3020, 1964 (Good)	4500
3020, 1962 (Fair)	3500*
3010 diesel, 1964 (Rough)	2850
3010 diesel, 1962 (Fair)	3250
3010, 1961 (Good)	3750*
3010 diesel, 1961 (Fair)	3500*
3010 diesel, 1961 (Fair)	4075*
2630, 1973 (Good)	8000*
25 0, 1966 (Good)	4350
2510, 1966 (Fair)	3800*
2510, 1964 (Fair)	3000*
2510, 1964 (Rough)	2350
2020, 1971 (Rough)	3750
2010, ldr., 1962 (Fair)	2350
2010, 1960 (Rough)	1125
1020, 1969 (Fair)	2700*
1010, ldr., 1962 (Rough)	2175
320, cult., 1956 (Fair)	1425
730 diesel, 1960 (Good)	3000
730 diesel, 1959 (Good)	2300*
730 diesel, 1959 (Fair)	1950
720, 1958 (Fair)	1625
720 diesel, 1957 (Fair)	1300*
620, 1956 (Rough)	1650
620, 1956 (Fair)	1425
620, 1956 (Rough)	1050*
520, 1957 (Fair)	1525*
60, 1954 (Good)	1450
70, 1954 (Fair)	1025
60, 1954 (Good)	900
420, 1957 (Rough)	1250
B, 1945 (Fair)	450
H, plow, cult., 1946 (Rough)	625

FORD TRACTORS

9000 diesel, 1971 (Fair)	6850
8000, 1971 (Fair)	6250*
5600 diesel, 1979 (Excellent)	8700
5000, ldr., 1970 (Fair)	4100*
4500, backhoe, ldr., (Fair)	6000*

4000, 1973 (Good)	2800*
3000 diesel, 1967 (Fair)	3800*
2000, Idr , 1959 (Rough)	2050
960, Idr., 1954 (Fair)	1550
900, 1956 (Rough)	1100*
861, Idr., 1956 (Fair)	2550*
861, 1955 (Fair)	1700*
860, 1956 (Good)	1900
860, 1956 (Good)	1475
850, 1956 (Good)	1475
600, 1955 (Good)	1475
Jub., 1953 (Fair)	1400
8N, 1952 (Fair)	1340
8N, 1952 (Rough)	1100*
8N, 1951 (Fair)	1200
8N, 1950 (Rough)	1175
8N, 1948 (Fair)	1150*
8N, 1948 (Fair)	1000
9N, Idr., 1945 (Fair)	1350
9N, Idr., 1945 (Rough)	1075
9N, 1944 (Fair)	950
9N, 1944 (Fair)	925

INTERNATIONAL HARVESTER TRACTORS

1468 diesel, 1970 (Good)	11,100
1468 diesel, 1970 (Good)	9250*
1466 diesel, 1973 (Fair)	9600*
1466 diesel, 1972 (Fair)	8750
1256 diesel, 1968 (Fair)	6000*
1206 diesel, 1967 (Fair)	5100*
1086 diesel, 1978 (Excellent)	18,500*
1066 diesel, 1973 (Good)	10,850
1066 diesel, 1973 (Good)	9950
1066 diesel, 1972 (Fair)	8750
986 diesel, 1977 (Good)	15,500
986 diesel, 1978 (Excellent)	15,500*
966 diesel, 1973 (Good)	9700
856 diesel, 1968 (Fair)	7500*
856 diesel, 1967 (Fair)	5750*
856, 1968 (Fair)	4850
806 diesel, 1966 (Fair)	5400*
806 diesel, 1966 (Rough)	3725
806, 1964 (Rough)	5200
806, 1964 (Rough)	5200
806 diesel, 1964 (Fair)	4650
806, 1964 (Good)	3750
706 diesel, 1965 (Good)	5000*
706, 1964 (Fair)	3150
706, 1963 (Fair)	2200
660, 1960 (Fair)	1100
560, 1962 (Fair)	1600*
560, 1962 (Fair)	1500*
560, 1961 (Fair)	1800
560, 1960 (Fair)	1400
560, 1958 (Rough)	1200
460, 1961 (Good)	1875
460, 1960 (Good)	2200
454 diesel, 1970 (Excellent)	4400
454, 1967 (Good)	4200
450, 1957 (Fair)	1435
450, 1956 (Fair)	960
400, 1956 (Fair)	950*
400, 1956 (Fair)	925
340, 1961 (Fair)	1725
340, Idr., 1960 (Fair)	1700
350, 1956 (Fair)	1000
140, Idr., 1960 (Rough)	1025
Sup. M, 1952 (Fair)	1100
Sup. M, 1952 (Fair)	1075
M, 1950 (Good)	1000
Sup. A, cult.; 1953 (Fair)	1525
Sup. A, 1952 (Fair)	1500
Sup. A, cult., 1953 (Fair)	1460
Cub Loboy, mo., 1965 (Good)	1600
Cub, mo., 1962 (Good)	1550
Cub 154, mo., 1968 (Good)	1750
140, 1977 (Excellent)	4500*

MASSEY-FERGUSON TRACTORS

1800 diesel, 1972 (Fair)	9200*
1155 diesel, 1974 (Excellent)	12,500*
1155 diesel, 1974 (Good)	10,100*
1135 diesel, 1973 (Good)	9500*
1100 diesel, 1970 (Fair)	4400
255, 1978 (Good)	5500
255, 1976 (Fair)	5100*
230, (New)	5400*
180, 1970 (Fair)	4300*
180, 1965 (Fair)	3650*
165, 1966 (Good)	3450
165, 1966 (Fair)	3450
165 Idr., 1965 (Fair)	3600
165, 1965 (Fair)	3500
165 diesel, 1964 (Fair)	3400
135 diesel, 1966 (Good)	3850
65, 1960 (Fair)	1400*
35, Idr., 1963 (Fair)	2200

OLIVER TRACTORS

1855, 1971 (Good)	6450
1850 diesel, 1968 (Fair)	6300
1850 diesel, 1967 (Fair)	4400
1850 diesel, 1967 (Good)	4400
1800, 1963 (Fair)	2850

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Implement & Tractor

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THE DEALER'S IN-HOUSE COMPUTER

1. Lou Stude[illegible] Setup page 16
2. Hank [illegible]s Advice for Shoppers page 20

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June 7, 1980 • Vol. 95 • No. 13

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

Dealers and In-House Computers

16: **At Studer Super Service, the Computer Is Important, but....** This Wisconsin dealership spent years developing a system for gathering all necessary data for operations and management decision-making. Then it was a matter of finding the right software. The actual selection of the hardware was the easiest part for this marvelously profitable dealership.

20: **So You Want to Buy a Computer!** Hank Parker, widely known consultant for farm equipment dealers, has some advice for dealers who are thinking of getting their own, in-house computer.

8: **Massey-Ferguson's Tractor Olympics.** Seeking a heftier slice of the North American market for over-100-horsepower tractors, MF brought its dealer representatives to Scottsdale, Ariz., for sessions aimed at honing competitive selling skills against other brands.

32: **Why Wouldn't Farmers Pay More for Product Reliability?** Frank Buckingham, contributing editor on ag engineering subjects, suggests that farmers, and everyone else in the chain, already pay the price when the reliability isn't there.

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what's ahead...

I&T SINCE 1886

June 7, 1980

RETAIL SALES OF FARM TRACTORS IN THE U.S. took a 47 per cent drop in the month of April, according to the flash report of the Farm & Industrial Equipment Institute.

Unit Retail Sales

Equipment	April 1980	April 1979	April Pct. Change	January-April 1980	January-April 1979	January-April Pct. Change
Farm Wheel Tractors						
2-wheel drive,						
40-100 hp	5,358	8,973	-40.3	18,540	24,101	-23.1
Over 100 hp	4,131	9,571	-56.8	16,688	26,913	-38.0
Total 2-wheel drive	9,489	18,544	-48.8	35,228	51,014	-30.9
4-wheel drive	1,138	1,637	-30.5	3,501	3,707	- 5.6
Total Tractors	10,627	20,181	-47.3	38,729	54,721	-29.2
Combines, S-P	1,012	1,852	-45.4	4,667	5,100	- 8.5
Balers*	821	840	- 2.3	2,170	3,208	-32.4
Forage Harvesters	522	320	+63.1	1,522	1,154	+31.9
Mower-Conditioners	1,060	1,193	-11.1	3,251	4,266	-23.8

*Bales under 200 lbs. **Shear-bar type

EXPORTS OF FARM EQUIPMENT IN THE FIRST QUARTER were considerably better than domestic retail sales. Foreign sales increased 16 per cent to $611.7 million, according to Dept. of Commerce figures. The major customer, Canada, bought $276 million (up 12 per cent); other Western Hemisphere nations took $111 million. The only major customer showing a decline was Mexico, off 9 per cent at $44.4 million. Australia's imports from the U.S. came to $38 million, up 56 per cent; France--up 17 per cent at $33 million; United Kingdom--up 21 per cent at $20 million; Belgium--even at $26 million; West Germany--up 13 per cent at $22 million; Japan--off 2 per cent at $11 million; South Africa--up 54 per cent at $7.4 million; Israel --up 32 per cent at $5.8 million.

ENROLLMENTS IN COLLEGES OF AGRICULTURAL ENGINEERING have more than doubled in recent years, according to the American Society of Agricultural Engineers, and the numbers of graduates have climbed, too. According to Machine Design magazine, 619 received bachelor's degrees last year, the highest number in decades. The problem area has been in graduate students: Universities have been having to cope with budget squeezes, thus limiting the salary potentials of teaching engineers. Industry, meanwhile, has been offering attractive salaries to graduates. Will the current downturn in the farm equipment business cut the number and attractiveness of job openings for graduates and raise interest in graduate studies and academic careers? Past experience indicates this is likely, but it hasn't begun happening yet.

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I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

BILL ENLOW TRACTOR SALES
Tulsa, Okla.
(March 8, 1980)

ALLIS-CHALMERS TRACTORS

HD5 dozer, diesel, 1956 (Good)	3850
190XT diesel, 1967 (Rough)	2500*

CASE TRACTORS

800, 1958 (Good)	1450
885, 1979 (Excellent)	6100*
1030 diesel, 1964 (Good)	2850
1030 diesel, 1966 (Good)	2900*
1070 diesel, 1968 (Good)	5700
1170 diesel, 1971 (Good)	6500

DAVID BROWN TRACTOR

990 diesel, 1964 (Good)	2300

DEUTZ TRACTOR

D10006 diesel, (Good)	2925

FERGUSON TRACTORS

30, 1952 (Fair)	875
30, 1953 (Good)	1175
30, 1953 (Good)	1350
30, 1954 (Good)	1360
40, 1958 (Fair)	1400*

FORD TRACTORS

9N, 1942 (Fair)	850
9N, 1944 (Fair)	750
9N, 1944 (Good)	900
9N, 1945 (Good)	950
9N, 1946 (Good)	975
9N, 1946 (Good)	1375
8N, 1948 (Rough)	725
8N, 1948 (Good)	1175
8N, 1948 (Good)	1110
8N, 1949 (Good)	1250*
8N, 1949 (Good)	1090*
8N, 1949 (Good)	1220*
8N, 1949 (Good)	1200
8N, 1949 (Good)	1000
8N, 1950 (Good)	1100
8N, 1950 (Fair)	930
8N, 1950 (Good)	1350*
8N, 1951 (Good)	1500
8N, 1951 (Good)	1375
8N, 1951 (Good)	1300
8N, 1951 (Good)	1400
8N, 1951 (Good)	1600
8N, 1952 (Good)	1600
8N, 1952 (Good)	1500
8N, 1952 (Good)	1675
8N, 1952 (Good)	1450
NAA, ldr., 1953 (Good)	1905*
NAA, 1953 (Fair)	1400
NAA, ldr., 1953 (Fair)	1650
NAA, 1953 (Good)	1600
NAA, 1953 (Good)	2050*
NAA, 1953 (Good)	2200*
NAA, 1953 (Good)	1750
NAA, 1953 (Good)	1950
NAA, 1953 (Good)	1850
NAA, ldr., 1953 (Fair)	1725
600, 1954 (Fair)	1600
600, 1955 (Good)	1890*
600, 1955 (Good)	2100
600, 1956 (Fair)	1700*
601, 1957 (Good)	2300
601, 1958 (Good)	2650
800, 1954 (Good)	2700
860, 1955 (Rough)	1500
860, 1956 (Good)	1900
860 diesel, 1956 (Good)	2850
801, 1957 (Good)	2450*
861, 1957 (Good)	1975
900, 1955 (Good)	1550
901 diesel, Select-O-Speed, 1956 (Good)	1100*
2000 diesel, 1974 (Good)	3950*
3000 diesel, 1965 (Good)	3000
3000 diesel, 1970 (Good)	3450
4000 diesel, 1964 (Fair)	3000
4000 diesel, 1964 (Good)	3300*
4000 diesel, 1965 (Good)	3500*
4000 diesel, 1966 (Good)	3460*
4000 diesel, 1966 (Fair)	3350
4000 diesel, 1967 (Good)	3450
4000 diesel, 1968 (Good)	3900*
4000 diesel, 1969 (Fair)	3050*
4500 diesel, backhoe, 1972 (Good)	5450*
5000 diesel, 1964 (Fair)	3400
5000 diesel, 1965 (Good)	3600*
5000 diesel, 1965 (Good)	3800*
5000 diesel, 1967 (Good)	4050
5000 diesel, 1969 (Good)	4800*
5000 diesel, 1972 (Good)	5350*
5000 diesel, 1973 (Good)	5200*
5000 diesel, 1973 (Fair)	4600
8000 diesel, 1969 (Good)	4800
9600 diesel, 1976 (Good)	10,600

INTERNATIONAL HARVESTER TRACTORS

Cub, 1955 (Good)	800
Cub Loboy, 1967 (Good)	1760
C, 1957 (Good)	400*
Super C, 1959 (Good)	675
TD-6, crawler, 1958 (Fair)	3150
300, ldr., 1957 (Fair)	1050*

(More...)

Auctions

(continued)

3414, backhoe, 1966 (Good)	3400*
140, 1968 (Good)	1875
B414 diesel, 1957 (Good)	1800
574 diesel, 1974 (Good)	5000
560 diesel, 1959 (Good)	1250*

JOHN DEERE TRACTORS

M, 1955 (Good)	1450
70 LP, 1956 (Good)	1200
1010 diesel, 1964 (Good)	2700
1010 diesel, 1966 (Good)	2700
2010, 1965 (Good)	2250
2010 diesel, 1967 (Good)	2750
2030 diesel, 1975 (Good)	6000*
3010 diesel, 1967 (Good)	4650
4020 diesel, 1965 (Good)	4900
4020 diesel, 1969 (Good)	6500
4020 diesel, 1969 (Good)	5700

LONG TRACTORS

350 diesel, 1970 (Good)	3300
440 diesel, 1969 (Good)	3250

MASSEY-HARRIS TRACTORS

22, 1953 (Good)	360
444, LP, 1956 (Good)	550*

MASSEY-FERGUSON TRACTORS

35 diesel, 1958 (Rough)	1500
35, 1958 (Fair)	1590*
35, 1959 (Good)	1750
35 diesel, 1960 (Good)	1950*
35, 1960 (Fair)	1600
35 diesel, 1962 (Good)	2150*
35, 1963 (Rough)	1500
35 diesel, 1964 (Good)	2738
50 diesel, 1962 (Good)	2100*
65 diesel, 1960 (Good)	1950*
65 diesel, 1960 (Fair)	1700
65, 1961 (Good)	1850*
65, 1961 (Fair)	1700
65 diesel, 1962 (Fair)	1775
65, 1962 (Good)	1900
65, ldr., 1962 (Fair)	1850
65 diesel, 1962 (Good)	2150*
65 diesel, ldr., 1962 (Fair)	1900
65 diesel, 1963 (Good)	2350
65 diesel, 1963 (Good)	2350
65, 1963 (Good)	2400
65 diesel, 1963 (Good)	2550
65 diesel, 1964 (Good)	2500
65 diesel, 1964 (Good)	2450*
65 diesel, 1964 (Good)	2500
65 diesel, 1964 (Good)	2650
65 diesel, ldr., 1964 (Good)	3250
65 diesel, ldr., 1964 (Excellent)	3650
88 LP, 1959 (Fair)	480*
135, 1965 (Good)	3000
135, 1966 (Good)	3100*
135 diesel, 1969 (Good)	3650
135 diesel, 1971 (Good)	3900
150, 1968 (Good)	2650*
150 diesel, 1969 (Good)	3150
165 diesel, 1965 (Rough)	1810
165 diesel, 1966 (Fair)	2850
165 diesel, 1966 (Fair)	3050
165 diesel, 1967 (Good)	3300
165 diesel, 1968 (Fair)	3150*
165 diesel, 1969 (Good)	3750
165 diesel, 1969 (Good)	4050
165 diesel, 1970 (Good)	4150
165 diesel, ldr., 1970 (Good)	4350
175 diesel, 1966 (Good)	4050
175 diesel, 1967 (Good)	3900*
175 diesel, 1969 (Good)	4500
175 diesel, 1971 (Good)	4950
180 diesel, 1965 (Fair)	2825
180 diesel, 1968 (Good)	3600*
180 diesel, 1968 (Good)	3800
202, ldr., 1967 (Good)	2150*
203, 1969 (Good)	2225
205 diesel, 4-W-D, 1980 (New)	5200*
20, backhoe, 1973 (Good)	5500
1100 diesel, 1968 (Fair)	3900*
230 diesel, 1979 (New)	6150*
230 diesel, 1979 (New)	6200*
245 diesel, 8-speed, 1979 (New)	7100*
255 diesel, 1977 (Good)	5750

MINNEAPOLIS-MOLINE TRACTORS

705 diesel, 1967 (Good)	3000*
G1000 diesel, 1968 (Good)	3600*

OLIVER TRACTORS

550 diesel, 1963 (Good)	1200
1800 LP, 1967 (Fair)	2650*

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

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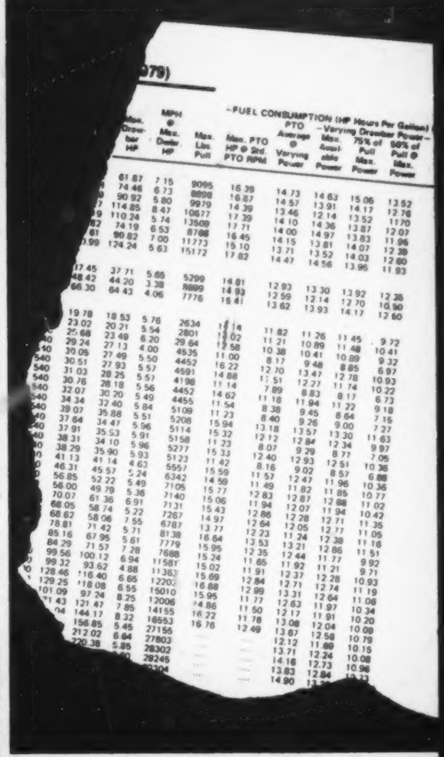
June 21, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

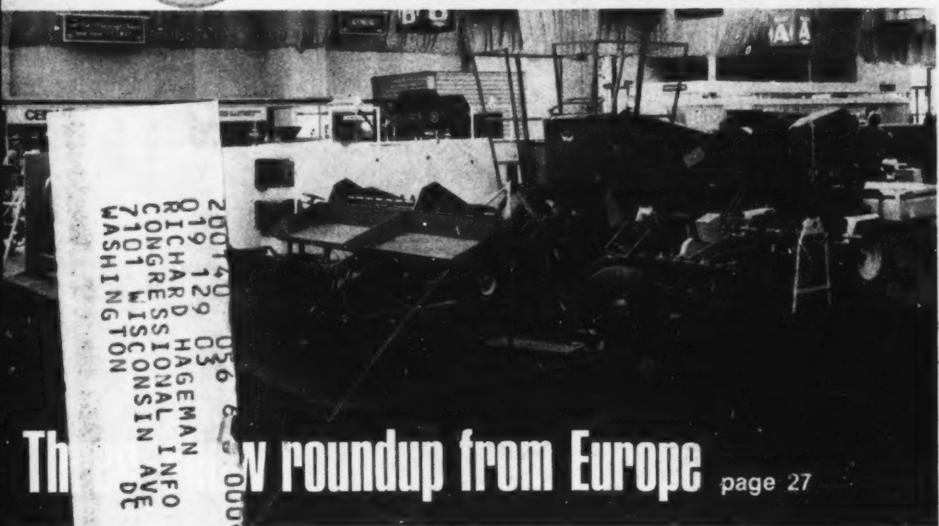
Implement&Tractor



(1979)

–FUEL CONSUMPTION (HP Hours Per Gallon)

Max. Drawbar HP | MPH @ Max. Drwbr HP | Max. Lbs. Pull | Max. PTO HP @ Std. PTO RPM | PTO Average @ Varying Power | –Varying Drawbar Power– Max. Available Power | 75% of Pull Max. Power | 50% of Pull @ Max. Power



Th... ...w roundup from Europe

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Fuel economy leaders at Nebraska [illegible]

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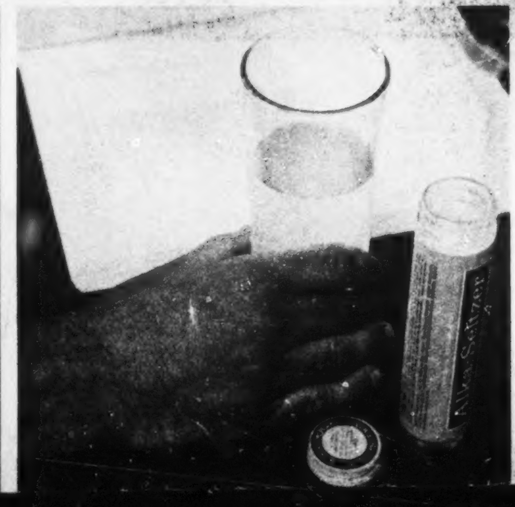

Return of the lease!

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June 21, 1980 • Vol. 95 • No. 14

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

6: **Return of the Lease!** As severe shortages of cash and credit hit U.S. agriculture, while farming operations move into higher tax brackets, the attractiveness of leasing has re-established itself. Here's what some manufacturers' finance executives and busy dealers have to say about the present situation.

12: **Some Tips for Selling High-Pressure Washers.** Farmers are considered by many marketers of this type of product to be a great, untapped market. Here's some merchandising advice, plus a list of who makes them.

16: **Second Sales Forecast Takes a Nosedive.** FIEI's Marketing & Management conference meets at the U. of Michigan to behold a "State of the Industry" consensus outlook report that runs far below the expectations of last January.

27: **Rounding Up Three European Shows.** A few of the many new products seen at the Amsterdam, Paris and Zaragoza (Spain) shows.

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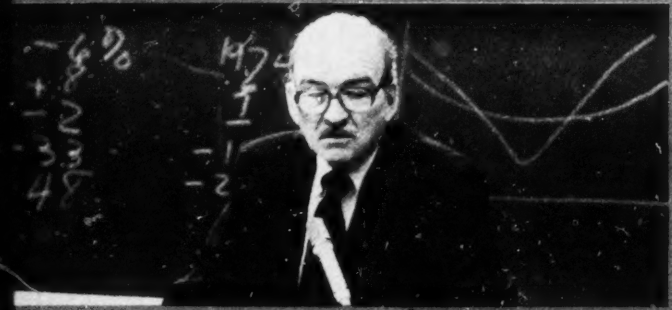
Marketing & Management Conference:

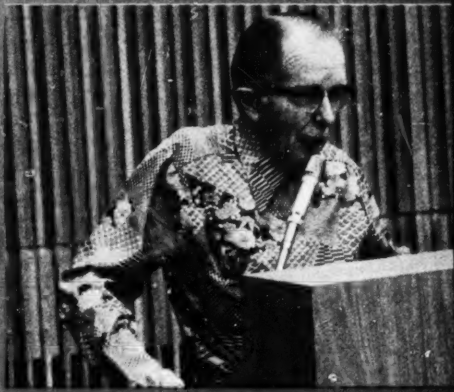
REVISED SALES OUTLOOK TAKES A NOSEDIVE

By Bill Fogarty

For the first time, FIEI held its Marketing & Management Conference on a university campus. The U. of Michigan's Graduate School of Business Administration brought in lecturers on a variety of topics.

In case you hadn't heard, the industry's prospects for 1980 look much worse than they did in January, when the FIEI's marketers last got together for a forecasting session.





Media and Expectations

William Porter, professor of journalism, talked about how media shape expectations. "Media," he said, "has created expectations relative to food production. There is the assumption that there is something sinister about that ill-defined unit of production called agribusiness which threatens a way of life called the family farm....I'm skeptical about media expectations that there could never be a cataclysmic crop failure and that agricultural chemicals are per se poisonous, though I detect a strong feeling about the latter in the press.

"When Norman Borlaug won the Nobel prize for his work that increased crop yields, his speech included the comment that those who want to ban pesticides are fools. His speech was largely ignored by the media, not because of any conspiracy but because what he said didn't jibe with what was expected....The bottom line of all this is—Don't expect much from the media. There is no magic public relations formula..."

Bert Head (Ford Tractor) functioned as program chairman of the conference and also reported on the "State of the Industry" consensus sales forecast.

■WAS THE May consensus forecast of unit sales, conducted by the Farm & Industrial Equipment Institute, particularly depressing? Following recent sales reports covering the first four months of 1980, certain aspects of the forecast have to be considered more puzzling than depressing.

After all, when the industry records a drop of 47 per cent in retail unit sales of tractors, which is what happened in April, there's probably not much left in the way of buoyant spirits that a dismal forecast could further depress.

Here's what's puzzling: After seeing what happened to tractor sales in April, the tractor manufacturers' forecasters, given another shot at estimating total unit sales for 1980, predicted that the total unit volume for the year would decline 10.7 per cent from 1979's level of 188,287 to 168,050 tractors. (In January, they were predicting a drop of 1.3 per cent.)

This means that to reach a sales level that amounts to a decline of 10.7 per cent, volume will have to be pretty strong in the last eight months of 1980. Conditions being what they are, can this industry average 16,165 tractor sales a month, May Day through New Year's Eve?

On a dollar basis, the group is forecasting a decline in dollar volume of farm equipment retail sales of 5 per cent. Forty-eight manufacturers of field equipment participated in this consensus prediction, and the spread of opinion ran from minus 25 to plus 19 per cent.

Taking a quick look at the ranges of opinion about various products' sales prospects, it becomes apparent that some manufacturers, or their marketing executives responsible for anticipating what the market will be like, have sharply overestimated what the industry will end up doing the rest of this year. As a result, some product forecasts may be distorted. (If the same overoptimistic forecasts are cranked into individual companies' marketing operations, grief for some could be severely compounded

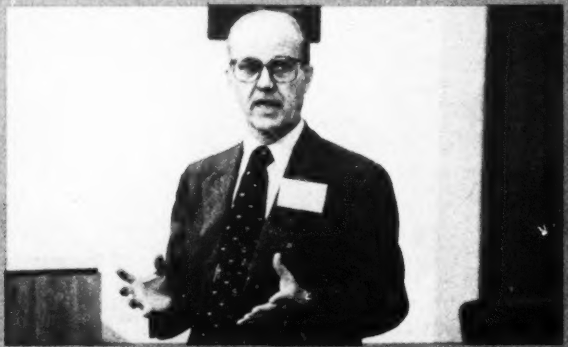
(More...)

Viewing the Economy

Dr. Paul McCracken, speaking on the general condition of the U.S. economy: "Our rate of increase of real gross national product per worker has been rising more slowly than that of any other country. What's wrong, what's producing this arthritis? For one thing, we have been generating too little technology, with a declining percentage of GNP going into research and development. If we'd kept up with R&D levels of the mid-1960's, we'd be doing about a third more R&D now than we are. And the technology is being cranked into the economy at too slow a rate; ours is a low-investment economy compared with the rest of the world.

"Two factors on the plus side: The Federal Reserve is trying to manage monetary policy by monetary aggregate rather than by interest rates, and thus we are seeing dramatic declines in interest rates. And U.S. exports remain strong."

Question: "Do you see us getting legislative relief on capital costs?" **McCracken:** "Yes. I'd like them to attach an index to depreciation schedules. I'd guess we'll get a shortening of depreciation schedules. Soon? Well, it could happen this year. If not, then more likely during the 1981-82 U.S. Congress."



Product Innovation

Merle Crawford, professor of marketing, talked about the strategies which the leadership of a company (or "strategic business unit") must put into place to assure a flow of product innovation. "How innovative is your industry?" he asked. "Are its products highly advertisable? Is there considerable personnel turnover, which is associated with a creative industry? Are product life cycles short? (Long cycles denote low innovation rates.) A new product failure rate of less than 25 per cent is not innovative. Do new companies emerge as leaders? Are salesmen welcomed (showing an openness to new ideas)?"

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U.S. RETAIL SALES, 1980 CONSENSUS FORECAST, SECOND TIME AROUND

Product	Actual 1979 Sales	Jan., 1980 Forecast	May 1980 Forecast	Pct. Change*
Farm Tractors				
39 hp and under	41,820	41,700	38,650	- 7.6
40-99 hp	72,477	71,800	65,100	-10.2
100 hp and over	62,535	66,000	54,000	-13.6
4-Wheel Drive	11,455	11,800	10,250	-10.5
Total Farm Tractors	188,287	190,000	168,050	-10.7
S-P Combines	32,246	31,500	30,325	- 6.0
Cornheads	22,374	21,000	20,750	- 7.3
Moldboard Plows	31,743	31,500	28,500	-10.2
Disk Harrows	63,316	66,250	58,000	- 8.4
Field Cultivators	16,951	20,600	16,000	- 5.6
[illegible]	15,345	18,000	15,000	- 2.3
Balers (under 200 lbs.)	18,750	17,600	16,300	-13.1
Balers (over 200 lbs.)	21,351	22,500	20,000	- 6.3
Forage Harvesters	12,451	12,250	11,650	- 6.4
Mower-Conditioners	25,600	25,000	23,000	- 9.4
Windrowers/Swathers	8,918	8,400	8,550	- 4.1
Grinder-Mixers	11,673	11,300	9,750	-16.5
Cotton Strippers	1,774	1,600	1,850	+ 4.3
Manure Spreaders**	19,107	19,500	17,750	- 7.1

*Percentage figures are given as medians—the approximate mid-point in the range of estimates.
**Box-type only.

by the end of the year.)

Here are some examples:

Four-wheel-drive tractors: Eight of 13 companies see sales off from 8 to 30 per cent, centering on about 12 per cent, but two companies are predicting an industry increase of 8 to 10 per cent. Consensus, a median figure, is for a decline of 10.5 per cent.

Field cultivators: Consensus is down 5.6 per cent; 14 firms see a decline of from 1 to 20 per cent, but one sees the market up 6 per cent, another up 12 per cent!

Big balers: Consensus—down 6.3 per cent. One marketer sees a 26 per cent drop; another looks for a 12 per cent increase!

Forage harvesters: Consensus—down 6.4 per cent. Seven of eight forecasters see drops of from 2 to 12 per cent, while one optimist looks for a rise of 11 per cent.

Grinder-mixers: Consensus—down 16.5 per cent. Seven firms see sales off from 14 to 23 per cent; the eighth participant sees a one per cent increase.

Among the forecasters of the Agri-Equipment Div. of FIEI, there are also vast spreads in opinion about the market outlook. The consensus among 35 participants is for a 12 per cent decline in dollar volume, ranging from a decline of 40 per cent (one estimate) to an increase of 10 per cent (two).

Examples of the diversity:

Augers and elevators: Consensus—off 15 per cent, with a range of from down 50 to up 10 per cent.

Farmstead equipment (for hogs): Consensus—down 30 per cent; 13 out of 14 see it down from 12 to 50 per cent, but one sees a 10 per cent increase.

Farmstead equipment (dairy/beef): Consensus—no change; the range is from down 10 to up 12 per cent.

Is anything upbeat?

In one product area, things are looking better than they did in January. Cotton stripper sales, which came to 1,774 units in 1979, were expected to be off 8.6 per cent when estimates were made last winter, but an improved cotton market has moved four makers of this equipment to come up with a consensus forecast of a 4.3 per cent increase to 1,850 units. One pessimist sees a 10 per cent decline; the other three anticipate hikes of from 2 to 10 per cent.

Conference program

The consensus forecast was reported as the kickoff feature of the FIEI's Marketing & Management Conference May 22-23 at the U. of Michigan at Ann Arbor. Besides delivering the forecast report, H. J. Head (Ford Tractor) also functioned as program chairman.

Under this arrangement, the university's Graduate School of Business Administration brought in leading educators from several departments on the campus to address the group.

Most widely known of the speakers was Dr. Paul McCracken, who is a past chairman of the Council of Economic Advisors and who has served as a consultant to three presidents of the United States. Talking about the U.S. economy, he indicated that the low point of the present recession would probably be in the fourth quarter of 1980.

Others on the program included William E. Porter, chairman of the university's department of journalism; C. Merle Crawford, professor of marketing; Thomas A. Roach, an attorney and a member of the university's board of regents; Warren E. Miller, professor of political science; James D. Papsdorf, associate chairman of the department of psychology; Bernard J. White, associate professor of organizational behavior and industrial relations; and Gilbert R. Whitaker, Jr., dean of the school of business administration.

Other FIEI activities

Next major meeting of the Farm & Industrial Equipment Institute is its annual convention Oct. 11-14 at Boca Raton, Fla. Marketing & Management Conferences next year will be Jan. 29-31 at Ft. Lauderdale, Fla., and May 20-22 at Springfield, Ill. ☐

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(May 13, 1980)

ALLIS-CHALMERS TRACTORS

7080 diesel, 1975 (Fair)	5700
7040 diesel, 1979 (Excellent)	16,000*
7000 diesel, 1976 (Good)	6900*
5050 diesel, 1979 (Excellent)	5300*

CASE TRACTORS

930 diesel, 1961 (Fair)	1000
550, trencher, bld., (Good)	4000*
DC, ldr., 1949 (Fair)	250*

DAVID BROWN TRACTORS

995 diesel, 1975 (Good)	3100*
990 diesel, 1970 (Good)	1800*
990 diesel, 1970 (Excellent)	2900*

MASSEY-FERGUSON TRACTORS

2500 fork lift, 1972 (Good)	4700*
1130 diesel, 1972 (Good)	4000
285 diesel, 1976 (Good)	7000
265 diesel, 1975 (Good)	6100*
245 diesel, 1976 (Good)	4400
235 diesel, 1975 (Good)	3600
230 diesel, 1979 (Excellent)	5500*
205, diesel, 1979 (Excellent)	3000*
180 diesel, 1967 (Good)	3000*
175 diesel, 1971 (Fair)	3500*
175 diesel, 1968 (Good)	3050
165 diesel, 1972 (Fair)	3600*
165 diesel, 1970 (Fair)	3400
165 diesel, 1969 (Good)	3000*
165 diesel, 1968 (Good)	2900*
165 diesel, 1967 (Good)	3100*
165 diesel, 1967 (Good)	3450
165 diesel, 1967 (Rough)	2375
165 diesel, 1967 (Good)	3100*
165 diesel, 1967 (Good)	3300
150 diesel, 1969 (Good)	2500*
135, 1970 (Good)	3200
135 diesel, 1967 (Good)	3300*
135, 1966 (Good)	3150
135 diesel, 1966 (Good)	2700*
Sup. 90 diesel, 1963 (Fair)	900
Sup. 90 diesel, 1962 (Fair)	1000
65 diesel, 1963 (Good)	2100*
65 diesel, 1962 (Good)	1800*
50 LP, 1958 (Fair)	1350
35, 1963 (Good)	1500*
35, 1963 (Fair)	1650
35 diesel, 1962 (Good)	1850
35 diesel, 1962 (Good)	1825*
35 diesel, 1960 (Fair)	1600
35, 1959 (Fair)	1550*
35, 1955 (Fair)	1300*
35, 1955 (Fair)	1200
35, 1955 (Fair)	1200*
T030, 1953 (Good)	1300
T020, 1949 (Fair)	725
TE20, 1948 (Good)	900

FORD-FERGUSON TRACTOR

9N, 1946 (Rough)	525

FORD TRACTORS

9600 diesel, cab, 1976 (Good)	6000*
5000 diesel, 1973 (Good)	5000
5000 diesel, 1966 (Rough)	1750*
4500 diesel, ldr., backhoe, 1971 (Good)	4200*
4500 diesel, 1970 (Fair)	2900*
4000 diesel, 1971 (Good)	4200
4000 diesel, 1970 (Good)	4000*
3000 diesel, 1970 (Good)	2750
3000 diesel, 1969 (Good)	2800*
3000 diesel, 1969 (Good)	2850
3000 diesel, 1968 (Good)	3200*
3000 diesel, 1967 (Good)	2600
2000 diesel, 1969 (Good)	3000*
861, 1961 (Excellent)	2500
850, 1955 (Good)	1750*
841 diesel, 1958 (Good)	1650*
841, 1958 (Good)	1650
641, 1960 (Good)	1700*
641, 1958 (Good)	1700*
640, 1956 (Excellent)	2100*
640, 1955 (Good)	1500*
640, ldr., 1955 (Good)	2250
541, 1958 (Good)	1625
NAA, 1954 (Fair)	1100
Jub., 1953 (Fair)	1250*
Jub, 1953 (Fair)	1250
Jub., 1953 (Good)	1500
8N, 1952 (Excellent)	1700*
8N, 1951 (Good)	1550
8N, 1951 (Good)	1650
8N, 1949 (Good)	975
8N, 1948 (Rough)	325
8N, 1948 (Good)	950
8N, 1948 (Good)	900*

INTERNATIONAL HARVESTER TRACTORS

3300 B, ldr., (Fair)	925
856 diesel, 1969 (Good)	4300*
706 diesel, 1967 (Fair)	3100*

(More...)

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Auctions *(continued)*

664 diesel, 1975 (Good)	3400*
664 diesel, 1972 (Excellent)	4600*
656 diesel, 1966 (Fair)	3200
574 diesel, 1973 (Fair)	2150
574 diesel, 1971 (Good)	3500*
574 diesel, 1970 (Good)	3200*
544 diesel, 1970 (Fair)	2100*
544 diesel, 1969 (Good)	3100*
544 diesel, 1969 (Rough)	1500
504 diesel, 1968 (Fair)	1300*
464 diesel, 1974 (Fair)	1700
460 diesel, 1959 (Good)	1400*
454 diesel, 1971 (Good)	3000*
424 diesel, 1965 (Good)	1650
364 diesel, 1976 (Good)	3200*
354 diesel, 1976 (Good)	2850*
354 diesel, 1976 (Rough)	1300
C, 1950 (Good)	400
Sup. A, cult., 1949 (Good)	1425
140, 1972 (Good)	1425
154 Cub, mo., 1969 (Excellent)	2050
Cub, 1950 (Good)	1050
Cub, cult., plt, plow, har., 1949 (Good)	1375
Cub, mo., 1948 (Fair)	600
B, (Fair)	226

JOHN DEERE TRACTORS

4020 diesel, 1971 (Good)	6700
4020 diesel, 1967 (Good)	5000
4020 diesel, 1965 (Good)	4600*
4020 diesel, 1965 (Good)	4500*
4000 diesel, 1969 (Good)	6100*
3020 diesel, 1967 (Rough)	2500
3010 diesel, 1962 (Good)	3350
3010 diesel, 1962 (Good)	3200
3010 diesel, standard, 1962 (Fair)	1500*
2640 diesel, 1976 (Good)	5900*
2640 diesel, 1976 (Excellent)	6400*
2030 diesel, 1974 (Good)	4850
2030 diesel, 1974 (Fair)	3900*
1020 diesel, 1968 (Good)	2150
420, 1957 (Good)	875
40, 1953 (Good)	875

LONG TRACTORS

1110 diesel, 1976 (Good)	4000
445 diesel, ldr., (Good)	1700*

MINNEAPOLIS-MOLINE TRACTORS

900 diesel, ldr., backhoe, 1968 (Good)	2500
M670 diesel, 1966 (Fair)	1350

OLIVER TRACTOR

55 diesel, ldr., 1955 (Rough)	625

YODER & FREY, INC.
Archbold, Ohio
(May 12 & 13, 1980)

ALLIS-CHALMERS TRACTORS

7030 diesel, 1974 (Fair)	11,000
7030 diesel, 1974 (Rough)	9000*
220, duals,	6000
220 diesel, 1970 (Rough)	5250*
200 diesel, 1974 (Good)	8200*
200 diesel, 1970 (Good)	8000
XT190 diesel, 1968 (Good)	5800*
XT190, 1965 (Fair)	4300*
180 diesel, 1968 (Good)	5900
160 diesel, ldr., 1968 (Fair)	2300
160 diesel, 1967 (Rough)	2100*
D21, 1967 (Fair)	5250*
D19, 1962 (Fair)	1600*
D17 diesel, 1962 (Fair)	1400*
D15, 1967 (Good)	1725
D15, 1961 (Fair)	1650
D10, 1960 (Fair)	850
WD45, 1953 (Fair)	900*
WD, 1953 (Rough)	530
G, plow, cult., 1955 (Fair)	770
C, 1954 (Rough)	425

CASE TRACTORS

1070 diesel, 1970 (Fair)	6900*
1030 diesel, 1966 (Rough)	3200*
930, 1965 (Good)	4100*
800 diesel, 1959 (Rough)	825
530, forklift,	2900
450, crawler,	4500

COCKSHUTT TRACTORS

550, 1958 (Rough)	800
540, 1958 (Fair)	910

DAVID BROWN TRACTORS

1200 diesel, 1961 (Fair)	2000
990, 1961 (Fair)	2750
900, 1957 (Fair)	810

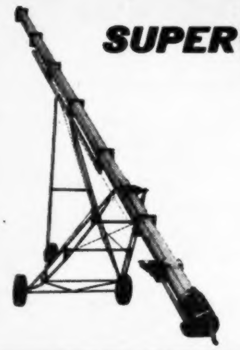
JOHN DEERE TRACTORS

4440 diesel, 1979 (Excellent)	25,000*
4320 diesel, 1972 (Good)	10,000*
4020 diesel, 1969 (Fair)	7400
4020 diesel, 1969 (Fair)	7100
4020 diesel, 1966 (Good)	7000
4020 diesel, 1967 (Fair)	6500*
4020 diesel, 1965 (Good)	6700*
4020, 1965 (Fair)	4250
4020, 1965 (Fair)	4200*
4010 diesel, 1961 (Fair)	4750*
4010 diesel, 1962 (Fair)	4550
4000 diesel, 1970 (Fair)	6525
3020 diesel, 1967 (Fair)	6100*
3020 diesel, 1965 (Fair)	3700
3020 diesel, 1964 (Fair)	3750*
3020, 1964 (Fair)	3000*
3020 diesel, 1964 (Good)	4500
3010 diesel, 1961 (Fair)	3750*
3010 diesel, 1961 (Fair)	3100
2510, 1966 (Fair)	3400*
2510, 1966 (Rough)	2750*
2020, ldr., 1966 (Fair)	4125
2010, 1962 (Fair)	2225
1020, 1967 (Good)	3000*
1010, ldr.,	1750
450, crawler, ldr.,	6100
730, 1960 (Fair)	2200
730, 1960 (Fair)	1850
730 diesel, 1959 (Good)	2275
730 diesel, 1959 (Fair)	2100
720 diesel, 1957 (Fair)	1600
720 diesel, 1956 (Rough)	1110
720 diesel, 1958 (Rough)	1050
630, 1959 (Good)	2550
630, 1958 (Fair)	1850
530, 1959 (Good)	1900
520, 1956 (Fair)	1450
80 diesel, 1956 (Good)	1500
70 diesel, 1957 (Good)	1100
70 diesel, 1956 (Fair)	1000
70, 1955 (Good)	985
70, 1954 (Rough)	975
50, 1957 (Fair)	975
G, 1946 (Rough)	500*
B, 3-pt. hitch, 1946 (Good)	800

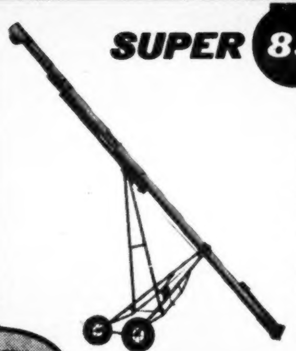
FORD TRACTORS

8600 diesel, 1975 (Fair)	8000
5000, 1970 (Good)	3870
5000, 1969 (Good)	4400*
4500, backhoe, ldr., (Fair)	5250*
4500, backhoe, ldr., (Rough)	4400*
3000, 1968 (Fair)	2500*
2000, 1961 (Fair)	2025
900, 1954 (Rough)	1000*
900, 1957 (Rough)	910
860, ldr., 1954 (Fair)	2150
Jub., 1953 (Good)	1325
8N, 1952 (Good)	1625

Auger Up Bigger Profits with KOYKER Super Augers



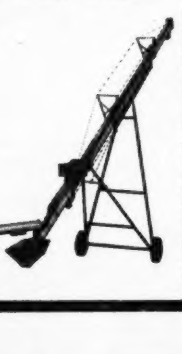
SUPER 105 Big . . . high-capacity industrial type auger for the farm. Has new 10" Super-Rib tube with special design that gives more space for large volume grain moving. Handles up to 6250 bu. per hour. Bottom-end drive enclosed in oil bath for minimum maintenance . . . long life. Super-105 is extendable from 52' to 72'. This bonus reach and height will allow your customers to reach most farm bins.



SUPER 85 Built for hard work, Super-85 has unique Super-Rib auger tube with effective diameter of 8½ inches . . . larger than any 8" auger on the market. Can handle up to 3500 bu. per hour. Powerful lower-end drive completely enclosed in oil. Super-85 available in 8 lengths from 33' to 68'. Heavy trussed-girder undercarriage engineered from high tensile steel tubing. Complete accessories available including Swing-A-Way hopper.

KOYKER

SUPER-75B



Rugged, powerful 7½" Super-75B moves as much grain as most 8" augers with only half the wear! Special screw turns about half the RPM's of most 6" augers. This means less maintenance . . . longer life. The economical Super-75B is extendable to meet your customers' future needs. Available in 8 lengths from 26' to 61'. Complete accessories: Safety Relief Gate; Swing-A-Way, Tilting or Triangle Hoppers; Cleaning Sections; Choice of Drives, Other Options.

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The inexpensive 6" price-conscious auger designed with same high-quality precision parts found only on larger 7½" augers. Will handle straight grain moving jobs that do not require specialized features. Available in 32', 42' and 47' lengths. PTO, Electric or Gas Drives.

Your sales and profits depend on supplying your customer with the exact auger he needs. Koyker Super Augers are packed with all the high-performance, fast-selling features that can make the Koyker line your top profit line. Write today for information and discounts. **WRITE DEPT. K-26-62**

OR CALL 712-439-1233

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8N, 1952 (Good)	1350
850, 1956 (Good)	1750
801, 1954 (Good)	1825*
800, 1954 (Fair)	1500
8N, 1952 (Fair)	1175
8N, 1951 (Good)	1320
9N, 1946 (Fair)	1120
9N, 1944 (Good)	920
9N, 1943 (Fair)	850
9N, 1942 (Fair)	750

INTERNATIONAL HARVESTER TRACTORS

1468 diesel, 1972 (Good)	9300
1466 diesel, 1971 (Fair)	9900
1456 diesel, 1969 (Fair)	8000
1256 diesel, 1967 (Fair)	7450
1256 diesel, 1967 (Fair)	6150
1086 diesel, 1977 (Excellent)	18,750*
1026 diesel, 1970 (Fair)	6800*
2500-A, 1969 (Fair)	2775
2400, 1973 (Good)	6300*
2300, ldr., 1970 (Good)	4000*
856 diesel, 1968 (Rough)	3600*
806 diesel, 1965 (Good)	5050*
806, 1965 (Fair)	3000
806, 1964 (Fair)	2400*
766 diesel, 1973 (Good)	9000*
706, 1966 (Fair)	3200*
706, 1965 (Fair)	2450*
706, 1964 (Good)	3575
706, 1964 (Fair)	2700*
706 diesel, 1963 (Fair)	2600*
656, 1965 (Fair)	2950
560, 1963 (Fair)	1425
560 diesel, 1960 (Good)	2575
560, 1960 (Fair)	1575*
560, 1959 (Fair)	2275
460 diesel, 1960 (Fair)	1410
460, 1961 (Fair)	1375
450, ldr., 1957 (Fair)	1510
400, (Rough)	685
340, ldr., 1959 (Fair)	960
300, 1955 (Fair)	830
300, 1955 (Rough)	800
M,	950
Sup. M, 1953 (Rough)	730
M, 1951 (Fair)	700
M, 1949 (Fair)	655
M, 1947 (Fair)	700
M, 1942 (Rough)	625
140, 1979 (Excellent)	4400*
140, cult., 1966 (Fair)	2425
130, cult., 1958 (Fair)	1210
130, 1956 (Fair)	1200
Sup. A, cult., 1950 (Fair)	1000*
Sup. A, cult., 1947 (Fair)	1000
A,	590
A, cult., 1945 (Fair)	550
Sup. C, 1952 (Fair)	950
Sup. C, mo., 1950 (Fair)	700
C, mo., 1950 (Fair)	700
154, 1964 (Fair)	1825
154, bld. mo.,	1625
154, mo., 1964 (Fair)	1625
154, mo., 1964 (Fair)	1500*
Cub, mo., 1959 (Fair)	1050

MASSEY-FERGUSON TRACTORS

1155 diesel, 1975 (Rough)	9000*
265, 1979 (Excellent)	7400*
230, 1979 (Excellent)	5400*
180, 1968 (Fair)	4600*
180 diesel, 1970 (Fair)	3600*
180, 1966 (Fair)	3400*
165, 1973 (Good)	3200
165 diesel, 1970 (Fair)	3150
165, 1969 (Fair)	3000*
150, 1970 (Rough)	2425*
135, 1969 (Fair)	4000*
135 diesel, 1969 (Fair)	3525
Sup. 90, (Rough)	885
65 diesel, 1960 (Fair)	1750
65, 1960 (Rough)	1100*
50, 1958 (Fair)	1700
35, ldr., 1960 (Rough)	2000*
35 diesel, 1959 (Fair)	1700*
35, ldr., 1959 (Fair)	1510

MINNEAPOLIS-MOLINE TRACTORS

G1050 diesel, 1970 (Rough)	3750*
G1000 Vista, 1969 (Rough)	3100*

OLIVER TRACTORS

1900 diesel, 1961 (Fair)	3300*
1850 diesel, 1965 (Fair)	4250*
1800, 1961 (Fair)	2300*
1755, 1970 (Good)	4400*
1750, 1967 (Fair)	3700*
1650 diesel, 1969 (Fair)	3350*
1600, 1964 (Fair)	1975
880, 1960 (Fair)	810
770 diesel, 1959 (Fair)	675
550, 1963 (Good)	1480
88, 1956 (Fair)	700*
55, 1955 (Fair)	910

WHITE TRACTORS

4-150, 1972 (Fair)	11,800*
2-105, 1973 (Excellent)	9250

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

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In fact, the Caldwell Grain Cart will pay for itself so fast, you could end up supplying a 400 or 700 bushel cart for every combine around.

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And for all-around versatility, the Caldwell Grain Cart comes with a standard bottom pit dump.

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July 15, 1980
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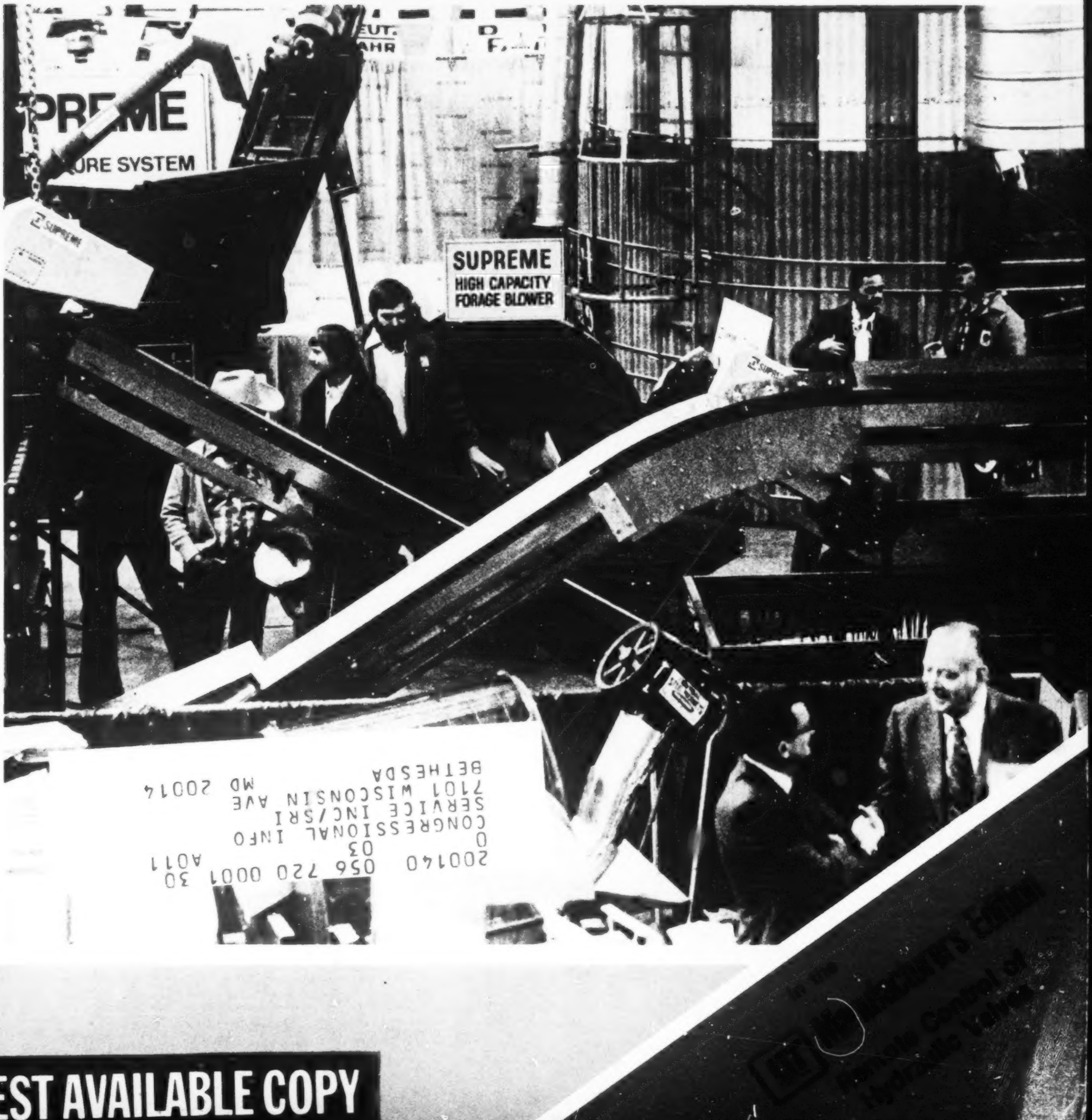
Serving the Farm and Industrial Equipment Industry Since 1886

Implement & Tractor

FARM EQUIPMENT SHOWS, CONVENTIONS, MEETINGS, 1980–1981

Complete listings start on page 32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INTERTEC PUBLISHING CORP.

July 15, 1980 • Vol. 95 • No. 15

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

10: **Three Dealers Talk About Sales Management.** Many dealers gradually shift over from handling all the sales themselves to directing the sales activities of others. But how well do they learn this function? Here's what three veteran dealers say on the subject.

14: **What Are You Planning for Your Centennial?** This Virginia dealership decided to mark the occasion with a booklet and a special open house. Here's how they went about preparing for it.

22: **The In-House Computer System Brim Tractor Designed.** Bill Brim has the ultimate resource—sons who know both the implement business and computers. The in-house computer system they designed for this dealership's two stores led to a new business, Dealer Information Systems Corp.

30: **International Harvester Introduces "Early Riser" Planter.** IH's 800 series Cyclo-Air and plate-type versions aim at a bigger slice of the hard-to-track row-crop planter market.

32: **Conventions, Meetings, Shows, 1980-1981.** The cover photo, taken at the National Farm Machinery Show last February in Louisville, reminds us that the farm equipment industry will soon be moving into its cycle that starts with the big outdoor Corn Belt shows and runs through the following spring.

56: **Where Are We With Automatic Guidance?** Frank Buckingham reports on the prevailing attitudes—not all in agreement—and on some recent research.

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what's ahead...

I&T
SINCE 1886

July 15, 1980

FARM EQUIPMENT MANUFACTURERS, after suffering a severe decline in April retail sales, made a better showing in the month of May, according to the Farm & Industrial Equipment Institute's flash report. Tractor sales in April had fallen off 47 per cent and for the year were down 29 per cent. May tractor sales were off 15 per cent from May, 1979, and all manufacturers were pushing to increase sales by offering strong incentives. The flash report:

Unit Retail Sales

	May			January-May		
Equipment	1980	1979	Pct. Change	1980	1979	Pct. Change
Farm Wheel Tractors						
2-wheel drive,						
40-100 hp	5,606	5,797	- 3.3	23,967	29,898	-19.8
Over 100 hp	4,266	5,435	-21.5	20,953	32,348	-35.2
Total 2-wheel drive	9,872	11,232	-12.1	44,920	62,246	-27.8
4-wheel drive	734	1,231	-40.4	4,237	4,938	-14.2
Total Tractors	10,606	12,463	-14.9	49,157	67,184	-26.8
Combines, S-P	931	945	- 1.5	5,600	6,045	- 7.4
Balers*	1,067	1,531	-30.3	3,220	4,739	-32.1
Forage Harvesters**	485	491	- 1.2	2,007	1,645	+22.0
Mower-Conditioners	1,723	2,661	-35.2	4,961	6,927	-28.4

*Bales under 200 lbs. **Shear-bar type

FORECAST FOR 1980 SALES OF INDUSTRIAL EQUIPMENT, as delivered last month at the meeting of the FIEI's Industrial & Construction Equipment Div., left little room for optimism. The consensus outlook sees 1980 results, compared with those of 1979, thus (Canadian estimates in parentheses): Industrial wheel tractors--down 14% (down 10%); rough-terrain forklifts--down 15% (down 8%); skid-steer loaders--down 18% (down 5%); crawler tractors under 90 hp--down 17% (down 11%); crawler tractors 90 hp and over--down 14% (down 8%); crawler loaders under 90 hp--down 16% (down 8%); crawler loaders 90 hp and over--down 22% (down 13%); wheel log skidders, 4WD, articulated--down 22% (down 12%); backhoes--down 19% (down 13%).

TRACTOR DEVELOPMENT ENGINEERS in the U.S. are said to be studying air-cooled diesel engines as a means of increasing fuel efficiency. According to USDA research on prices farmers are currently paying for production inputs, the average outlay for diesel fuel rose from 60.5 cents a gallon as of May 15, 1979, to $1.00 twelve months later. LP-gas, meanwhile, rose in cost from 39.1 cents to 61.8 cents.

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RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-Mar., 1979				Cumulative for Jan.-Mar., 1980			
	Mar., 1979		Mar., 1980		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	363	67	291	49	839	14	853	149	666	28	694	108
Alaska	1	1	2	.....	2	.....	2	9	3	.....	3	2
Arizona	79	72	69	36	205	28	233	170	217	22	239	132
Arkansas	469	51	389	49	998	61	1,059	109	842	113	955	132
California	461	367	480	319	1,084	83	1,167	895	1,039	72	1,111	710
Colorado	135	72	118	56	232	47	279	147	214	49	263	166
Connecticut	14	22	10	17	42	.....	42	56	40	.....	40	51
Delaware	35	4	15	2	62	7	69	12	40	3	43	7
Florida	203	185	195	121	502	17	519	418	563	20	583	325
Georgia	482	100	352	58	1,251	11	1,262	237	899	20	919	112
Hawaii	3	10	2	5	19	.....	19	24	12	.....	12	34
Idaho	122	27	107	15	227	334	261	46	236	21	257	39
Illinois	807	141	387	78	1,806	165	1,971	367	1,327	182	1,509	196
Indiana	490	72	299	45	1,048	98	1,146	183	688	127	815	127
Iowa	1,103	50	497	33	2,564	130	2,694	108	1,681	156	1,837	70
Kansas	568	30	341	42	1,057	126	1,183	77	721	129	850	98
Kentucky	594	71	364	38	1,213	20	1,233	143	936	22	958	79
Louisiana	292	102	332	74	653	40	693	198	669	86	755	151
Maine	14	13	8	19	43	.....	43	29	35	2	37	31
Maryland	75	48	78	32	203	9	212	102	161	17	178	66
Massachusetts	7	28	5	26	27	.....	27	70	25	.....	25	64
Michigan	246	138	164	101	648	53	701	279	506	48	554	213
Minnesota	688	84	411	57	1,320	143	1,463	154	846	141	987	104
Mississippi	435	112	411	28	982	37	1,019	230	913	88	1,001	77
Missouri	665	87	407	61	1,425	49	1,474	191	968	78	1,046	154
Montana	135	14	97	17	200	91	291	40	227	58	285	46
Nebraska	636	23	429	19	1,426	70	1,496	47	1,042	114	1,156	52
Nevada	16	21	13	14	41	1	42	52	23	4	27	33
New Hampshire	3	13	10	8	20	.....	20	36	24	.....	24	18
New Jersey	45	54	29	45	82	2	84	126	68	.....	68	116
New Mexico	58	43	26	22	125	9	134	75	86	7	93	53
New York	205	117	156	69	529	17	546	263	442	19	461	192
North Carolina	5[illegible]4	110	338	59	1,251	22	1,273	266	802	13	815	163
North Dakota	336	24	175	8	518	230	748	56	331	169	500	17
Ohio	482	126	385	87	1,101	68	1,169	311	893	93	986	204
Oklahoma	348	68	237	64	672	55	727	143	534	78	612	139
Oregon	96	41	91	63	247	13	260	115	257	14	271	127
Pennsylvania	218	120	217	98	509	7	516	304	491	16	507	271
Rhode Island	3	6	.....	9	5	.....	5	15	4	.....	4	15
South Carolina	188	47	164	32	549	8	557	130	400	15	415	79
South Dakota	301	16	177	14	610	64	674	39	397	66	463	27
Tennessee	531	129	308	54	1,136	24	1,160	260	754	25	779	100
Texas	960	441	732	411	2,404	97	2,501	953	2,316	152	2,468	907
Utah	50	35	49	47	122	2	124	73	102	3	105	94
Vermont	27	3	14	1	61	1	62	9	46	.....	46	3
Virginia	286	91	199	84	608	4	612	198	503	7	510	181
Washington	171	99	166	40	370	33	403	208	370	29	399	96
West Virginia	45	24	21	19	104	.....	104	49	77	.....	77	31
Wisconsin	577	85	400	65	1,248	42	1,290	153	925	52	977	129
Wyoming	29	26	19	25	102	4	106	54	55	7	62	48
U.S. Government	3	243	2	39	9	.....	9	269	26	.....	26	251
Miscellaneous‡	.....	145	33	8	10	.....	10	254	117	.....	117	166
TOTAL	14,624	4,118	10,221	2,782	32,511	2,038	34,547	8,901	25,559	2,365	27,924	6,806

Data released June 6, 1980, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland, Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; International Harvester; Long; Massey-Ferguson; R. M. Wade (Satoh); Steiger; Versatile; and White.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state of as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

RETAIL SALES OF SELECTED FARM EQUIPMENT—Jan.-Mar. 1979 and 1980 (1)

(In Units)

							Windrowers Self-Propelled							
	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Power Units		Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980
Alabama	39	32	15	6	18	15	.....	1	.....	.....	90	58	5	1
Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	5	9	.....	.....	2	5	10	13	11	19	4	3	2	1
Arkansas	70	62	1	.....	41	28	.....	.....	.....	.....	19	33	.....	2
California	9	50	4	4	37	26	56	63	63	68	6	.....	12	10
Colorado	19	31	7	14	32	23	33	17	34	19	29	35	12	9
Connecticut	.....	.....	.....	.....	5	8	.....	.....	.....	.....	.....	.....	3	4
Delaware	2	5	1	3	1	1	.....	.....	.....	.....	4	5	1	1
Florida	12	9	13	4	13	14	.....	.....	.....	.....	21	19	.....	7
Georgia	60	47	38	40	21	9	.....	1	.....	1	182	126	6	7
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Idaho	21	22	3	3	44	33	22	37	22	35	22	18	2	6
Illinois	345	381	335	385	44	34	.....	2	.....	2	279	197	43	36
Indiana	278	266	214	265	65	27	.....	4	.....	4	253	148	27	30
Iowa	445	499	286	453	66	42	26	12	25	12	922	566	61	82
Kansas	178	256	28	35	75	32	72	46	72	44	135	101	15	29
Kentucky	66	42	33	26	57	27	.....	1	.....	1	164	157	12	15
Louisiana	41	36	.....	.....	18	1	.....	.....	.....	.....	8	4	.....	2
Maine	1	.....	.....	.....	8	2	.....	.....	.....	.....	.....	.....	6	3
Maryland	15	22	13	16	17	10	1	1	1	1	16	12	10	9
Massachusetts	.....	.....	.....	.....	4	3	.....	.....	.....	.....	1	.....	.....	1
Michigan	55	86	44	70	47	24	7	3	7	3	98	82	41	50
Minnesota	252	234	140	187	146	80	100	41	100	41	376	250	83	74
Mississippi	69	59	1	.....	20	7	.....	.....	.....	.....	25	13	3	4
Missouri	147	173	77	94	77	48	12	8	12	8	274	232	21	14
Montana	29	37	.....	1	40	31	33	43	33	43	30	25	2	7
Nebraska	174	297	107	214	41	22	67	45	65	42	281	244	23	36
Nevada	.....	.....	.....	.....	4	8	7	6	6	7	.....	2	1	1
New Hampshire	.....	.....	.....	.....	5	5	.....	.....	.....	.....	1	.....	3	4
New Jersey	11	3	5	5	13	.....	.....	.....	.....	.....	9	3	.....	3
New Mexico	.....	4	.....	2	17	9	13	8	13	8	8	3	.....	.....
New York	17	23	18	34	67	62	8	8	8	9	41	47	57	74
North Carolina	66	40	43	35	29	24	2	.....	2	.....	94	71	11	9
North Dakota	141	139	4	6	6	8	61	33	62	31	66	53	11	7
Ohio	229	215	170	146	115	45	2	2	2	2	233	166	33	34
Oklahoma	56	109	.....	2	172	58	16	12	18	13	71	53	4	5
Oregon	13	18	.....	3	39	40	36	14	35	16	18	12	8	3
Pennsylvania	32	35	28	44	159	90	11	5	11	7	138	106	52	82
Rhode Island	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina	38	35	19	11	9	6	.....	.....	.....	.....	46	26	1	3
South Dakota	56	77	36	43	11	8	86	41	87	42	158	149	22	28
Tennessee	83	52	21	24	96	44	.....	1	.....	1	115	91	16	10
Texas	60	110	22	19	173	48	10	9	10	8	106	85	11	6
Utah	3	4	.....	1	26	19	10	15	11	15	35	16	4	7
Vermont	.....	.....	.....	.....	15	7	.....	.....	.....	.....	1	1	10	14
Virginia	29	21	28	14	63	45	.....	3	.....	3	61	38	16	17
Washington	48	41	3	2	38	26	16	22	14	19	11	10	7	9
West Virginia	1	.....	2	.....	28	14	.....	.....	.....	.....	11	11	6	.....
Wisconsin	29	69	48	100	297	202	42	46	41	46	239	189	167	240
Wyoming	4	7	2	1	28	12	18	12	18	13	13	4	4	2
U.S. Government	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTAL	3,248	3,657	1,809	2,312	2,368	1,332	777	575	783	583	4,714	3,464	834	1,000

Date released June 6, 1980, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.

(2) For making bales of under 200 lbs.

(3) Pull-type, mounted, self-propelled.

(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types 1979	Mower Conditioners All Types 1980	Manure Spreaders Conveyor-Type 1979	Manure Spreaders Conveyor-Type 1980	
21	9	5	8	Alabama
.....	.....	.....	.....	Alaska
.....	2	3	3	Arizona
58	45	36	35	Arkansas
8	3	22	12	California
15	5	24	22	Colorado
14	4	32	24	Connecticut
2	2	27	34	Delaware
12	8	9	8	Florida
28	30	17	17	Georgia
1	.....	1	.....	Hawaii
9	15	47	31	Idaho
100	62	349	220	Illinois
103	53	268	159	Indiana
220	112	887	543	Iowa
122	75	84	73	Kansas
141	127	109	92	Kentucky
11	10	5	5	Louisiana
12	4	26	23	Maine
32	14	81	85	Maryland
5	7	31	19	Massachusetts
72	47	280	270	Michigan
168	117	620	431	Minnesota
13	8	6	5	Mississippi
253	208	145	108	Missouri
7	16	2	7	Montana
87	83	141	151	Nebraska
.....	2	2	5	Nevada
3	4	6	18	New Hampshire
9	9	13	21	New Jersey
2	.....	1	2	New Mexico
103	100	541	478	New York
47	36	54	60	North Carolina
11	7	13	20	North Dakota
208	101	407	324	Ohio
151	68	17	20	Oklahoma
24	29	26	29	Oregon
177	122	538	484	Pennsylvania
1	1	.....	.....	Rhode Island
18	11	10	14	South Carolina
15	13	66	65	South Dakota
112	80	70	60	Tennessee
175	124	52	50	Texas
7	11	33	36	Utah
21	17	79	66	Vermont
76	95	81	88	Virginia
13	13	54	42	Washington
33	14	28	16	West Virginia
352	252	985	710	Wisconsin
1	3	10	8	Wyoming
.....	.....	.....	.....	U.S. Government
.....	.....	.....	.....	Miscellaneous
3,073	2,178	6,343	5,001	TOTAL

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

YODER & FREY, INC.
Archbold, Ohio
(June 10, 1980)

ALLIS-CHALMERS TRACTORS

7030 diesel, 1976 (Good)	8500*
220 diesel, 1972 (Fair)	4700*
200 diesel, 1970 (Good)	8500
XT190, 1968 (Fair)	3850
D21, 1968 (Rough)	5100*
D19, (Rough)	1010*
D17, 1966 (Good)	1500*
D14, 1962 (Good)	985
WD45, 1956 (Good)	840
WD, 1952 (Good)	600
B, mo., 1955 (Fair)	785
C, 1951 (Fair)	725*

CASE TRACTORS

1170 diesel, 1973 (Fair)	6900*
1070, 1973 (Rough)	6700*
1030, 1965 (Rough)	2700*
930, 1964 (Good)	3400*
730, 1963 (Fair)	2100*
730, 1959 (Rough)	1650*
600, 1960 (Rough)	775
430, ldr., 1964 (Fair)	2125
400 diesel, 1958 (Fair)	1000

JOHN DEERE TRACTORS

4440 diesel, 1979 (Excellent)	23,000*
4020, 1966 (Fair)	4400*
4020 diesel, 1965 (Good)	5700*
3020 diesel, 1968 (Fair)	4300*
3020, 1966 (Fair)	3575
3020, 1966 (Fair)	3325
3010 diesel, 1961 (Fair)	3600*
3010, 1960 (Fair)	3525
2510 diesel, 1965 (Fair)	3800
2510, 1967 (Fair)	2550*
2020 diesel, 1967 (Fair)	3000
2010, 1961 (Rough)	1425
1120 diesel, 1970 (Fair)	2000
1020, 1967 (Rough)	2700*
720 diesel, 1957 (Fair)	2100
720 diesel, 1956 (Rough)	1050
630, 1959 (Fair)	2225*
70, 1954 (Good)	975
70, 1954 (Good)	975
70, 1954 (Fair)	925
70 diesel, 1954 (Fair)	850
520, 1957 (Fair)	1075*

DAVID BROWN TRACTORS

995 diesel, 1976 (Good)	3825
885 diesel (New)	4400*

DEUTZ TRACTOR

40-06, 1967 (Good)	3150

FERGUSON TRACTORS

30, 1950 (Rough)	1075*
20, 1946 (Fair)	1175
20, 1947 (Fair)	1100

FORD TRACTORS

8000, 1970 (Good)	4600
6000, (Rough)	1000*
5000, 1970 (Fair)	3325
4500, backhoe, ldr., (Good)	7950
4500, backhoe, ldr., (Fair)	4950*
4500, backhoe, ldr., (Fair)	4600*
4000, Select-O-Speed, ldr., 1961 (Fair)	2300*
4000, 1961 (Good)	2175
4000 Select-O-Speed, 1960 (Good)	1650
4000, 1960 (Fair)	1375
3400, backhoe, ldr., (Good)	5700
3000, 1970 (Fair)	2750*
2000, 1966 (Fair)	2675
900, 1955 (Rough)	1075
640, 1955 (Fair)	1590
600, 1956 (Fair)	1635
Jub., 1953 (Fair)	1725*
8N, ldr., 1951 (Fair)	1600
8N, 1950 (Good)	1100
8N, ldr., 1949 (Rough)	925*
9N, ldr., 1946 (Fair)	1100*
9N, 1946 (Fair)	900
9N, 1946 (Fair)	810
9N, 1945 (Fair)	770

INTERNATIONAL HARVESTER TRACTORS

3388 diesel, 4-W-D, (New)	27,000*
1466 diesel, 1975 (Fair)	7250*
1466 diesel, 1973 (Good)	9825
1466 diesel, 1972 (Good)	7900
1066 diesel, 1976 (Excellent)	17,000*
1026, 1973 (Rough)	5700*
966 diesel, 1973 (Good)	8500*
966 diesel, 1973 (Good)	7400*
856, 1967 (Fair)	3700*
806 diesel, 1966 (Fair)	4900*
806, 1965 (Fair)	4000*
806 diesel, 1964 (Fair)	2600*
806, 1964 (Fair)	2400*
766 diesel, 1972 (Good)	8500*
706, 1964 (Fair)	2000*
706, 1963 (Good)	3500
656 Hydro, 1968 (Good)	4450*
656, 1967 (Good)	3275
656, 1967 (Fair)	2950*
560 diesel, 1961 (Good)	2100*
560, 1960 (Fair)	1450*
560, 1960 (Fair)	1325
504, 1962 (Fair)	2150
450 diesel, 1957 (Rough)	675
350, 1957 (Rough)	900
340, 1960 (Fair)	1200*
Sup. M, 1953 (Fair)	985
M, 1950 (Fair)	875
M, 1950 (Fair)	875
M, 1950 (Fair)	825*
M, 1950 (Rough)	580
M, 1950 (Fair)	760
H, 1947 (Fair)	520
Sup. A, plow, cult., 1953 (Fair)	1250
C, cult., 1950 (Good)	950
C, cult., 1950 (Fair)	725
C, mo., 1949 (Fair)	720
154, mo., 1964 (Fair)	1860
140, (New)	4250*
Cub, cult,., plt., 1960 (Fair)	1225
Cub, bld., 1959 (Fair)	1050*
Cub, mo., 1956 (Fair)	950*

MASSEY-FERGUSON TRACTORS

2135, ldr., 1966 (Fair)	1975
1155 diesel, 1974 (Fair)	7250*
1080 diesel, 1970 (Rough)	3500*
265, (New)	8200*
230, (New)	5100*
180, 1970 (Fair)	4000*
180, 1970 (Fair)	3200*
180, 1970 (Fair)	3100*
165, 1967 (Good)	3050
165, 1965 (Fair)	2550
150, 1970 (Rough)	2250
135, 1965 (Rough)	3300*
135, 1964 (Fair)	2800*
135 diesel, ldr., 1963 (Rough)	2750
65, 1964 (Good)	2625
65 diesel, 1961 (Good)	2100*
65, 1961 (Fair)	1400*
65, 1960 (Fair)	1725
50, 1960 (Fair)	1975

MINNEAPOLIS-MOLINE TRACTORS

G1050 diesel, 1970 (Rough)	3500*
G1000, 1965 (Rough)	2850*

OLIVER TRACTORS

2150, 1967 (Fair)	7500*
1900 diesel, 1960 (Fair)	3200
1850 diesel, 1967 (Fair)	4200
1800, 1961 (Fair)	2500
1800, 1962 (Fair)	1700
1755, 1971 (Good)	4600*
1750, 1966 (Fair)	4550
1650 diesel, 1971 (Fair)	5400
1650 diesel, 1971 (Fair)	5400
1600, 1961 (Fair)	2700*
88, 1956 (Fair)	1025

WHITE TRACTOR

4-150 diesel, 4-W-D, 1975 (Fair)	10,700*

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(June 10, 1980)

ALLIS-CHALMERS TRACTORS

7000 diesel, 1976 (Good)	7200
5040 diesel, 1976 (Good)	3350*

G, cult., plt., plow, 1951 (Good)	1000

CASE TRACTORS

580 D-B, ldr., backhoe, 1972 (Good)	7000
580 D-B, ldr., backhoe, 1971 (Good)	7550

DEUTZ TRACTOR

10006 diesel, 1978 (Excellent)	8700*

DAVID BROWN TRACTORS

996 diesel, 1975 (Excellent)	3650*
885 diesel, 1972 (Good)	2500*
880 diesel, 1967 (Fair)	1000*

MASSEY-FERGUSON TRACTORS

2500, forklift, (Good)	4750
1085 diesel, 1973 (Good)	6100*
285 diesel, 1977 (Excellent)	7700
285 diesel, 1975 (Good)	6900
265 diesel, 1975 (Good)	6000*
245 diesel, 1977 (Good)	4200
180 diesel, 1967 (Good)	3150
175 diesel, 1973 (Rough)	2000
175 diesel, 1971 (Good)	4000
175 diesel, 1970 (Fair)	3325
175 diesel, 1969 (Good)	3900*
175 diesel, 1968 (Fair)	3100
165 diesel, 1973 (Fair)	2800*
165 diesel, 1971 (Fair)	3300
165 diesel, 1968 (Good)	3900*
165 diesel, 1967 (Good)	3550*
165 diesel, 1966 (Good)	3200*
165 diesel, 1966 (Rough)	1850
165 diesel, 1966 (Fair)	2900*
165 diesel, 1966 (Good)	3600
135 diesel, 1973 (Rough)	1900
135 diesel, 1973 (Fair)	2500
135 diesel, 1972 (Excellent)	3600*
135 diesel, 1969 (Good)	3150
135 diesel, 1969 (Good)	3200*
135 diesel, 1967 (Good)	2475*
135 diesel, 1967 (Good)	2725
135 diesel, 1966 (Good)	3200*
135, 1966 (Good)	2450
65 diesel, 1964 (Good)	1850
65 diesel, 1963 (Good)	1725*
65 diesel, 1963 (Good)	2200
65 diesel, 1962 (Fair)	1500
65 diesel, 1962 (Fair)	1750
35 diesel, 1961 (Good)	2150*
35, 1960 (Fair)	1450
35, 1960 (Good)	2200
35, 1956 (Good)	1400*
20 D-C, 1978 (Good)	7300
TO20, 1950 (Fair)	775

FORD TRACTORS

7000 diesel, cab, 1973 (Good)	6000
5000 diesel, 1971 (Fair)	3600*
5000 diesel, 1969 (Good)	4900
5000 diesel, 1971 (Good)	5000
5000 diesel, 1969 (Good)	4150
5000 diesel, 1968 (Good)	3700
5000 diesel, 1966 (Rough)	3300
5000 diesel, Select-O-Speed, 1966 (Rough)	1600
5000 diesel, 1966 (Fair)	3000
4500 diesel, ldr., backhoe, 1971 (Good)	4200
4000 diesel, 1971 (Good)	4250*
4000 diesel, 1968 (Good)	4200*
3000 diesel, 1971 (Fair)	2750
3000 diesel, 1968 (Excellent)	3800
3000 diesel, 1967 (Good)	3250
3000 diesel, 1967 (Good)	3250
3000 diesel, 1967 (Good)	2950
2000 diesel, 1967 (Good)	2300*
850, 1956 (Good)	1600
841 diesel, 1958 (Fair)	1250
841 diesel, 1958 (Good)	1500
841 diesel, ldr., 1958 (Fair)	1250*
841, 1958 (Good)	1600
641, 1960 (Good)	1850*
641, 1959 (Good)	1800*
641, 1959 (Good)	1875
640, 1957 (Excellent)	2100
640, 1955 (Good)	1475
Dexta, 1959 (Good)	1500*
NAA, 1954 (Good)	1675*
8N, 1951 (Fair)	1000*
8N, 1951 (Good)	1400
8N, 1951 (Good)	1375
8N, 1950 (Fair)	1025
8N, 1948 (Rough)	700
8N, 1948 (Rough)	725*
8N, 1948 (Fair)	875
8N, 1948 (Good)	1000*
8N, 1948 (Fair)	850*
8N, 1948 (Good)	1050*

INTERNATIONAL HARVESTER TRACTORS

2500 diesel, 1972 (Good)	3200
856 diesel, 1969 (Good)	4800*
664 diesel, 1972 (Good)	3500*
656 diesel, 1966 (Rough)	2500
574 diesel, 1972 (Good)	3600*
574 diesel, 1972 (Good)	3600*
574 diesel, 1972 (Fair)	3000*
544 diesel, 1969 (Fair)	2500
544 diesel, 1968 (Good)	3500*
504 diesel, 1967 (Good)	1750
464 diesel, 1975 (Rough)	1500*
460, 1959 (Good)	1100*
424 diesel, 1956 (Good)	2300
B414 diesel, 1967 (Rough)	450
404, 1964 (Good)	1150
364 diesel, 1976 (Good)	3450
354 diesel, 1973 (Good)	2950
Sup. H, 1953 (Good)	475*
H, ldr., plow, 1944 (Rough)	160
H, 1942 (Rough)	110
C, cult., plt., 1948 (Good)	725
140, 1967 (Good)	1400
Cub, cult., plt., plow, 1964 (Good)	2250
Cub, mo., 1963 (Good)	2000
Cub, mo., 1946 (Good)	1100
Cub, mo., 1948 (Good)	1000
Cub, 1948 (Rough)	600
Cub, cult., plow, plt., 1948 (Good)	900

JOHN DEERE TRACTORS

4020 diesel, 1965 (Good)	5650
4020 diesel, 1965 (Good)	5750
4010 diesel, 1963 (Rough)	2700*
3020 diesel, 1968 (Good)	4700*
3020 diesel, 1964 (Good)	4200
2640 diesel, 1976 (Good)	6700*
2510 diesel, 1966 (Good)	3800*
2020 diesel, 1970 (Good)	2900
2010, 1963 (Good)	1900*
520, 1957 (Fair)	800*
420, 1956 (Fair)	600
400 diesel, ldr., backhoe, 1969 (Good)	3050
40, 1953 (Good)	875

LONG TRACTOR

460 diesel, (Good)	4000*

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

August 21, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

Implement&Tractor

[illegible]

survey report starts on page 6

How engineers feel about Bergland's stand against mechanization research
page 14

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August 21, 1980 • Vol. 95 • No. 17

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

6: **Special Report on Auctions.** An I&T survey shows more farm equipment dealers are utilizing auctions to lessen their inventories of new and used equipment. Auction men report prices are generally down on certain equipment, but there are indications times are getting better.

14: **ASAE: What Are the Priorities?** Ag engineers meeting in San Antonio examined research, extension and teaching priorities as part of their program with the theme, "Managing Resources in Transition: Agriculture's Challenge for the '80s."

24: **Quentin Tolby Likes His In-House Computer.** Tolby Equipment's computer system handles payroll, bookkeeping, parts control, summarizes sales records, processes statements, maintains shop records and allows 26 employees to concentrate on sales and service.

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what's ahead...

I&T
SINCE 1886

August 21, 1980

RETAIL SALES OF FARM EQUIPMENT IN JUNE were down in all categories reported in the Farm & Industrial Equipment Institute's flash report, but the weakness in tractor sales, which had persisted throughout the year, had slackened somewhat. They were down 47 per cent in April, down 15 per cent in May and down 8 per cent in June.

	Unit Retail Sales					
	June			January-June		
Equipment	1980	1979	Pct. Change	1980	1979	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-100 hp	6,820	7,050	- 3.3	30,826	36,948	-16.6
Over 100 hp	3,885	4,611	-15.7	24,840	36,959	-32.8
Total 2-wheel drive	10,705	11,661	- 8.2	55,666	73,907	-24.7
4-wheel drive	791	841	- 5.9	5,031	5,779	-12.9
Total Farm Tractors	11,496	12,502	- 8.0	60,697	79,686	-23.8
Combines (S-P)	1,513	2,198	-31.2	7,111	8,243	-13.7
Balers*	2,632	3,724	-29.3	5,851	8,463	-30.9
Forage Harvesters**	782	1,529	-48.9	2,787	3,174	-12.2
Mower-Conditioners	4,469	6,835	-34.6	9,430	13,762	-31.5

*Bales under 200 lbs. **Shear-bar type

WHAT ABOUT INVENTORIES OF FARM TRACTORS? At the end of May (latest FIEI figures), the number of new farm tractors in the hands of manufacturers and dealers was 80,696 (excluding under-30-hp sizes), which was 29 per cent higher than a year earlier. While sales of 40-99 hp tractors have been the least impacted by the current sales slump, inventories are up about 40 per cent from the 32,978 units on hand May 31, 1979. Two-wheel-drive tractors of 100 hp and over, most severely hurt by the slump (off 35 per cent through May and 33 per cent through June), nevertheless had an inventory increase of only 15 per cent--to 27,890. Four-wheel-drive tractor inventory was up 47 per cent at 6,765. Within that group, the inventory of units under 200 hp jumped 150 per cent from 1,292 to 3,255, indicating that International Harvester's recently introduced 2+2 line was well-stockpiled before its 6-month strike began.

INVENTORIES OF SELF-PROPELLED COMBINES as of May 31 were down 11 per cent, from 16,178 to 14,306, at which times sales for the year were off 7 per cent.

DOWN-THE-ROAD PROSPECTS FOR DEERE, IHC, as seen by Terry Nagelvoort, analyst for Goldman Sachs, investment firm: "Revived equipment purchases in 1981 should cause tight inventory for the leading manufacturers. We believe the marginal producers will be under pressure and will probably lose market share over the next few years. Thus, Deere and IH are expected to gain a larger portion of the farm equipment market."

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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(July 8, 1980)

ALLIS-CHALMERS TRACTORS

5040 diesel, 1976 (Fair)	2900*
5040 diesel, 1976 (Good)	3400*
XT 190 diesel, 1968 (Fair)	2800

CASE TRACTOR

580 D-B, ldr., backhoe, 1971 (Good)	8200*

DAVID BROWN TRACTORS

995 diesel, 1975 (Excellent)	3400*
885 diesel, 1973 (Good)	2550*
885 diesel, 1972 (Good)	2350
880 diesel, 1967 (Good)	1000

MASSEY-FERGUSON TRACTORS

1130 diesel, bld., 1967 (Fair)	3100*
1085 diesel, 1973 (Good)	5300*
1080 diesel, 1972 (Good)	3700*
265 diesel, 1975 (Good)	5900*
202, 1964 (Good)	1050
180 diesel, 1968 (Good)	3450
175 diesel, 1974 (Good)	3750
175 diesel, 1970 (Good)	3850
175 diesel, 1969 (Good)	3600*
175 diesel, 1968 (Good)	3600*
165 diesel, 1967 (Good)	3000*
165 diesel, 1967 (Good)	3250*
165 diesel, 1967 (Good)	3400*
165 diesel, 1966 (Good)	3400*
165 diesel, 1966 (Fair)	2975
135 diesel, 1968 (Excellent)	3500*
135, 1967 (Rough)	1500
135 LP, 1967 (Fair)	1900*
135 diesel, 1966 (Fair)	2500
135 diesel, 1966 (Good)	2750*
135 diesel, 1966 (Fair)	2600*
65 diesel, 1963 (Good)	1650*
35 diesel, 1963 (Excellent)	2050
35, 1963 (Good)	1600*
35 diesel, 1962 (Good)	1650
35 diesel, 1961 (Excellent)	2200*
35, 1956 (Good)	1375*
TO30, 1952 (Rough)	550*

FORD TRACTORS

7000 diesel, 1974 (Rough)	3500
5000 diesel, 1975 (Excellent)	5450*
5000 diesel, 1968 (Rough)	2000
4400 diesel, 1966 (Rough)	1300
4000 diesel, 1971 (Good)	4150
4000 diesel, 1970 (Rough)	2160*
4000 diesel, 1963 (Rough)	575
3000 diesel, 1971 (Good)	2550
3000 diesel, 1971 (Excellent)	4000
3000 diesel, 1967 (Good)	2400*
2000 diesel, 1967 (Good)	2000*
941, 1959 (Good)	1200*
850, 1955 (Fair)	1625*
841 diesel, 1958 (Fair)	1650*
841 diesel, 1958 (Good)	2250
841 diesel, 1958 (Fair)	1500
641, 1960 (Fair)	1600*
641, 1959 (Fair)	1700*
Dexta, 1959 (Good)	1550
NAA, 1954 (Fair)	1000
Jub., 1953 (Fair)	1225
8N, 1948 (Good)	1000*
8N, 1948 (Fair)	700
8N, 1948 (Fair)	875

INTERNATIONAL HARVESTER TRACTORS

1466 diesel, 1975 (Good)	9500
1086 diesel, cab, 1976 (Good)	10,100
986 diesel, 1977 (Good)	9450*
674 diesel, 1974 (Good)	4150
574 diesel, 1972 (Fair)	3300*
574 diesel, 1972 (Fair)	3550*
544 diesel, 1968 (Fair)	3550*
460, 1959 (Good)	1350*
B 414 diesel, 1962 (Good)	1175
350, 1958 (Rough)	275
Cub, 1948 (Rough)	500
A, 1946 (Good)	600*

JOHN DEERE TRACTORS

3010 diesel, 1962 (Fair)	2650
3010 diesel, 1962 (Good)	3350
3010 diesel, 1962 (Rough)	1550
2510 diesel, 1966 (Good)	3900*
2010, 1963 (Excellent)	1800
1010, 1963 (Good)	1275
M, 1951 (Fair)	550

KUBOTA TRACTOR

L260 diesel, 1976 (Good)	2325

LONG TRACTORS

460, (Good)	3800*
445 diesel, ldr., (Fair)	2200

OLIVER TRACTORS

2-150, 1969 (Good)	6750
1755 diesel, (Fair)	4200

YODER & FREY, INC.
Archbold, Ohio
(July 8, 1980)

ALLIS-CHALMERS TRACTORS

7030, 1976 (Good)	8800*
5050 diesel, 1979 (Excellent)	4200*
XT190, 1968 (Fair)	3800*
D19 diesel, 1965 (Fair)	2600
D19,	1750
D17, 1962 (Fair)	1600*
D15, 1966 (Fair)	1675
D15, 1965 (Fair)	1200*
D12, 1964 (Fair)	1390
WD45, 1956 (Good)	1000
WD45, 1956 (Fair)	685
WD45, 1955 (Rough)	575*
WD, 1953 (Rough)	475*
C, 1955 (Fair)	375

CASE TRACTORS

1200 diesel, 1966 (Rough)	4000*
1170 diesel, 1974 (Fair)	6800*
730 diesel, 1963 (Fair)	2700
730, 1963 (Rough)	1700*
730 diesel, 1963 (Fair)	1600*

DAVID BROWN TRACTORS

1200 diesel, 1963 (Good)	3350
1200 diesel, 1960 (Fair)	3125
1200 diesel, 1960 (Fair)	2500*
885 diesel, 1978 (Excellent)	5000*

DEUTZ TRACTOR

40-06, 1970 (Fair)	3475

JOHN DEERE TRACTORS

4440 diesel, 1979 (Excellent)	24,000*
4430 diesel, 1974 (Good)	14,100*
4230 diesel, 1979 (Good)	13,600
5020 diesel, duals, 1968 (Fair)	6700
5020 diesel, 1968 (Fair)	6600*
4020 diesel, 1965 (Fair)	5400
4010 diesel, 1962 (Fair)	3300
3010, 1962 (Rough)	1600
2510, 1967 (Fair)	3275
2510, 1967 (Good)	2600*
2010, 1960 (Rough)	1000
1010, backhoe-ldr.,	4000
720, 1957 (Fair)	1275*
630, 1958 (Good)	2425
420, 1956 (Fair)	1050*
70, 1954 (Fair)	1150*
70 diesel, 1954 (Rough)	725
60, 1954 (Good)	800*
50, ldr., 1953 (Good)	1250
50, 1953 (Rough)	680
50, 1953 (Rough)	550*
40, 1954 (Fair)	1000*

FORD TRACTORS

4500, backhoe-ldr.,	4850
4000, 1972 (Fair)	4525
4000, ldr., 1970 (Good)	4000*
4000, 1958 (Good)	1700*
3000, bld., 1970 (Rough)	1950
3000, 1967 (Good)	3675
3000, 1967 (Rough)	2675*
2000, 1967 (Fair)	1200*
1600, bld., 1979 (Excellent)	4500
860, 1956 (Fair)	1575
850, backhoe-ldr.,	1925
801, 1956 (Good)	1600*
650, 1956 (Fair)	1575
600, 1955 (Good)	1435
Maj., 1953 (Fair)	1275
8N, plow, 1950 (Fair)	1625*
8N, ldr., 1950 (Fair)	1050
8N, ldr., 1950 (Fair)	950
8N, 1949 (Good)	950*
8N, 1949 (Fair)	975*
8N, ldr., 1949 (Fair)	825*
9N, 1946 (Rough)	600
9N, 1945 (Fair)	850
9N, 1945 (Fair)	750

INTERNATIONAL HARVESTER TRACTORS

1256 diesel, 1968 (Fair)	7100*
1086 diesel, 1978 (Excellent)	18,000*
1066 diesel, 1972 (Fair)	8200*
966 diesel, 1972 (Good)	9000*
856 diesel, 1967 (Good)	7250
4100,	5300
2504, ldr., 1970 (Fair)	2800*
806 diesel, 1965 (Fair)	6000
806 diesel, 1965 (Fair)	4450*
806 diesel, 1965 (Good)	4400*
806, 1965 (Fair)	3500*
806, 1964 (Fair)	2700*
806, 1964 (Rough)	2400*
706, 1964 (Fair)	2600*
706 diesel, 1964 (Rough)	2450
706, 1963 (Fair)	2625
560, 1963 (Fair)	1500
560, 1961 (Fair)	1400*
504, 1962 (Good)	2475*
460, 1962 (Good)	1425
460 diesel, 1961 (Fair)	1450
454, 1973 (Good)	4050
450, 1957 (Fair)	850*
350, 1958 (Good)	1025
140, (New)	4250*
Sup. M, 1953 (Fair)	1200
Sup. M, 1953 (Fair)	1000*
Sup. MTA, 1952 (Rough)	1050
M diesel, 1952 (Fair)	750
M, 1950 (Good)	950
M, 1950 (Fair)	900
M, 1950 (Rough)	800
M, 1948 (Rough)	500
Sup. H, 1954 (Fair)	750
H, cult., 1951 (Good)	670
154, 1967 (Good)	2000*
154, mo., 1964 (Rough)	990
Cub, mo., 1966 (Fair)	1775
Cub, cult., mo., plow,	1085
Cub, mo., 1950 (Fair)	900*
Cub, plow, cult., mo.,	875

MASSEY-FERGUSON TRACTORS

1155 diesel, 1974 (Rough)	6000*
1080 diesel, 1970 (Rough)	3400*
180, duals, 1970 (Fair)	2800*
165, plow, 1967 (Good)	3850
135, 1970 (Good)	2850
135, 1969 (Fair)	2450
65 diesel, 1960 (Good)	2150
65 diesel, 1958 (Fair)	2100*
35 diesel, 1961 (Fair)	1875*

MINNEAPOLIS-MOLINE TRACTORS

G1050 diesel, 1967 (Rough)	3000*
G1000 diesel, 1971 (Rough)	2800*
G900, 1967 (Fair)	3300
Jet Star 3, 1957 (Good)	2100*
Jet Star 2, 1956 (Fair)	1950

OLIVER TRACTORS

2150 diesel, 1975 (Fair)	4000*
2150 diesel, 1975 (Fair)	3300*
1900 diesel, 1960 (Fair)	3200*
1855 diesel, 1971 (Good)	4600*
1600, 1962 (Fair)	3275
1600, 1962 (Fair)	2700
1650, ldr., 1967 (Fair)	2500
1755, 1971 (Good)	4700*
1250 diesel, 1968 (Fair)	1225
880 diesel, 1960 (Fair)	1100
770, 1960 (Fair)	1500*
770, 1957 (Fair)	720*
Sup. 88 diesel, 1957 (Fair)	650

BILL ENLOW TRACTOR SALES
Sapulpa, Okla.
(July 12, 1980)

ALLIS-CHALMERS TRACTORS

C, 1946 (Fair)	110
CA, 1952 (Good)	350
WD, 1949 (Good)	500*
WD-45, 1956 (Fair)	325
D-15 LP, 1962 (Good)	1450*
D-17 LP, 1961 (Fair)	1250

CASE TRACTOR

1030 diesel, 1966 (Fair)	2600*

FERGUSON TRACTORS

20, 1946 (Good)	1000
20, 1946 (Fair)	800
20, 1947 (Good)	1075
20, 1948 (Fair)	950

20, 1948 (Good)	1000*
20, 1948 (Fair)	875
20, 1949 (Rough)	725
20, 1949 (Good)	1075
30, 1952 (Good)	1375
40, 1956 (Fair)	1050

FORD TRACTORS

Fordson, 1935, (Good)	850
9N, 1942 (Good)	950
9N, 1942 (Fair)	800*
9N, 1943 (Good)	1110
9N, 1943 (Good)	1025
9N, 1944 (Good)	1010
9N, 1944 (Good)	1000
9N, 1945 (Good)	1100
9N, 1945 (Good)	1175
9N, 1945 (Good)	1000
9N, 1946 (Fair)	825
9N, 1946 (Good)	1200
8N, 1947 (Good)	1225
8N, 1947 (Good)	1150
8N, 1947 (Fair)	925*
8N, 1948 (Good)	1100
8N, 1948 (Good)	1225
8N, 1949 (Good)	1225
8N, 1949 (Good)	1130
8N, 1949 (Fair)	900*
8N, 1950 (Good)	1150*
8N, 1950 (Good)	1175*
8N, 1950 (Good)	1150
8N, 1950 (Good)	1100*
8N, 1950 (Good)	1250
8N, 1950 (Good)	1200*
8N, 1951 (Fair)	950
8N, 1951 (Good)	1150*
8N, 1951 (Fair)	980*
8N, 1951 (Good)	1075
8N, 1951 (Good)	1150*
8N, 1951 (Good)	1000*
8N, 1951 (Good)	1175
8N, 1951 (Good)	1200*
8N, 1952 (Good)	1225
8N, 1952 (Good)	1450
8N, 1952 (Fair)	1050*
8N, 1952 (Good)	1300
8N, 1952 (Good)	1225*
8N, 1952 (Good)	1300
8N, 1952 (Good)	1350
8N, 1952 (Excellent)	1850
8N, 1952 (Good)	1425
8N, 1952 (Good)	1575
8N, ldr., 1952 (Good)	1675
8N, 1952 (Good)	1600
8N, 1952 (Good)	1400
8N, 1952 (Good)	1300*
8N, backhoe, 1952 (Good)	1750*
8N, 1952 (Good)	1350
8N, 1952 (Good)	1425
NAA, 1953 (Rough)	1000
NAA, ldr., 1953 (Good)	2100
NAA, 1953 (Fair)	1500
NAA, 1953 (Good)	1950
NAA, 1953 (Good)	1650*
600, 1954 (Good)	1675
600, 1954 (Good)	1800*
600, 1955 (Good)	1775*
600, 1956 (Good)	2150
600, 1956 (Good)	1900*
640, 1955 (Rough)	1250*
601, 1957 (Good)	2100
601, 1958 (Good)	2500
641, 1958 (Good)	1975
800, Select-O-Speed, 1954 (Fair)	1150*
850 LP, 1955 (Good)	1500
850, 1955 (Good)	1925
860, 1955 (Good)	1775
801 LP, 1957 (Fair)	1225*
801 diesel, 1958 (Good)	2500
801 diesel, 1958 (Good)	2350*
3000, 1962 (Fair)	1750*
3000, 1964 (Fair)	2450
4000 diesel, 1965 (Fair)	2950
4000 diesel, 1966 (Good)	3000
5000 diesel, Select-O-Speed, 1964 (Fair)	2700
5000 diesel, 1969 (Fair)	2950*
5000 diesel, 1970 (Good)	3500*
5000 diesel, 1970 (Good)	3425
8000 diesel, 1968 (Fair)	3850

INTERNATIONAL HARVESTER TRACTORS

Cub, 1952 (Fair)	750*
Cub, mo., 1957 (Good)	1300*
Cub, mo., 1960 (Good)	1450
Cub Loboy, mo., 1967 (Good)	1800
154 Cub, mo., 1968 (Good)	1800
H, 1947 (Good)	400
H, 1948 (Good)	450
H, 1953 (Good)	725*
M, 1951 (Good)	575
140, 1963 (Good)	2000
140, 1965 (Good)	1950*
240, 1960 (Fair)	1420
444, 1962 (Good)	2425
444, ldr., 1963 (Fair)	2100*
2544, 1967 (Fair)	2250
574 diesel, 1974 (Excellent)	5500

JOHN DEERE TRACTORS

A, 1948 (Good)	850
B, 1950 (Fair)	300*
D, 1944 (Good)	450
435 diesel, 1959 (Good)	1750*
2010, 1963 (Fair)	1700
300, 1969 (Fair)	2200*
2030 diesel, 1973 (Good)	5500*

MASSEY-FERGUSON TRACTORS

35, 1959 (Rough)	1300
35, 1960 (Rough)	1350
35, 1960 (Fair)	1550
35, 1962 (Good)	1800
35 diesel, 1963 (Good)	2350
50, 1961 (Fair)	1580*
65, 1960 (Fair)	1650
65, 1961 (Good)	1800*
65, 1962 (Good)	1925
65, 1962 (Good)	2000
65, 1964 (Good)	2300
65, 1964 (Good)	2500
85, 1961 (Rough)	900
135 diesel, 1966 (Fair)	3000
135 diesel, 1968 (Fair)	2700
165 diesel, 1965 (Fair)	3050
165 diesel, 1967 (Fair)	3100
165 diesel, 1967 (Good)	3275
165 diesel, 1969 (Good)	3675
175 diesel, 1966 (Fair)	3250
175 diesel, 1968 (Good)	3500
175 diesel, 1970 (Good)	3700
180 diesel, 1967 (Fair)	2950*
1080 diesel, 1971 (Good)	5200*
1100 diesel, 1967 (Fair)	3100
1100 diesel, cab, 1970 (Good)	5300*
204, 1968 (Fair)	2600*
230 diesel, 1980 (New)	6350*
230 diesel, 1980 (New)	6450*
230 diesel, 1980 (New)	6250*
230 diesel, 1980 (New)	6400*
230 diesel, 1980 (New)	6400*
245 diesel, 1979 (Excellent)	7200
245 diesel, 1980 (New)	6950*
255 diesel, 1980 (New)	9350*
265 diesel, 1980 (New)	9000*
265 diesel, 1980 (New)	9400*
265 diesel, 1980 (New)	9250*
275 diesel, 1980 (New)	12,500*
275 diesel, 1980 (New)	12,300*
285 diesel, 1980 (New)	13,500*

MINNEAPOLIS-MOLINE TRACTORS

M-5, 1960 (Rough)	300
670 LP, 1965 (Fair)	1200*
1000 diesel, 1967 (Good)	3600

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-April, 1979				Cumulative for Jan.-April, 1980			
	April, 1979		April, 1980		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	382	78	213	26	1,215	20	1,235	227	874	33	907	134
Alaska	.....	5	1	1	2	.....	2	14	4	.....	4	3
Arizona	79	65	71	33	282	30	312	235	279	31	310	165
Arkansas	576	72	428	56	1,532	103	1,635	181	1,225	158	1,383	188
California	570	401	447	186	1,633	104	1,737	1,296	1,457	101	1,558	896
Colorado	173	80	136	36	384	68	452	227	322	77	399	202
Connecticut	19	45	46	23	61	.....	61	101	86	.....	86	74
Delaware	31	4	25	3	90	10	100	16	64	4	68	10
Florida	243	165	170	102	740	22	762	583	734	19	753	427
Georgia	510	92	231	39	1,758	14	1,772	329	1,128	22	1,150	151
Hawaii	6	13	5	9	25	.....	25	37	17	.....	17	43
Idaho	199	21	112	15	401	59	460	67	334	35	369	54
Illinois	1,476	178	467	56	3,144	303	3,447	545	1,702	274	1,976	252
Indiana	845	87	327	50	1,816	175	1,991	270	974	168	1,142	177
Iowa	1,812	40	564	21	4,253	253	4,506	148	2,175	226	2,401	91
Kansas	467	38	377	34	1,476	174	1,650	115	998	229	1,227	132
Kentucky	733	83	360	23	1,933	33	1,966	226	1,289	29	1,318	102
Louisiana	356	88	245	62	984	65	1,049	286	892	108	1,000	213
Maine	22	17	16	14	65	.....	65	46	51	2	53	45
Maryland	130	65	86	30	328	14	342	167	244	20	264	96
Massachusetts	19	41	9	15	46	.....	46	111	34	.....	34	79
Michigan	553	150	225	62	1,162	92	1,254	429	706	73	779	275
Minnesota	1,138	87	489	42	2,304	297	2,601	241	1,223	253	1,476	146
Mississippi	496	50	311	29	1,458	57	1,515	280	1,203	109	1,312	106
Missouri	778	116	345	66	2,163	89	2,252	307	1,286	105	1,391	220
Montana	184	18	181	28	310	165	475	59	365	101	466	74
Nebraska	663	33	295	9	2,047	112	2,159	80	1,292	159	1,451	61
Nevada	10	15	15	10	51	1	52	67	37	5	42	43
New Hampshire	12	9	14	10	32	.....	32	45	38	.....	38	28
New Jersey	42	95	37	39	124	2	126	221	105	.....	105	155
New Mexico	59	37	73	16	182	11	193	112	157	9	166	69
New York	336	120	249	84	849	33	882	383	684	26	710	276
North Carolina	676	124	377	52	1,912	37	1,949	390	1,174	18	1,192	215
North Dakota	584	14	311	21	900	432	1,332	70	517	294	811	38
Ohio	803	179	417	70	1,847	125	1,972	490	1,266	137	1,403	274
Oklahoma	408	66	228	43	1,050	85	1,135	209	734	106	840	182
Oregon	155	80	133	23	394	21	415	195	380	24	404	150
Pennsylvania	330	192	168	79	834	12	846	496	656	19	675	350
Rhode Island	.....	3	1	3	5	.....	5	18	5	.....	5	18
South Carolina	290	41	165	20	833	14	847	171	558	22	580	99
South Dakota	397	17	183	6	962	109	1,071	56	543	103	646	33
Tennessee	686	101	272	38	1,811	35	1,846	361	1,016	35	1,051	138
Texas	1,047	402	684	334	3,397	151	3,548	1,355	2,950	202	3,152	1,241
Utah	107	58	81	17	226	5	231	131	175	11	186	111
Vermont	41	6	18	3	101	2	103	15	64	.....	64	6
Virginia	341	88	198	39	949	4	953	286	696	12	708	220
Washington	223	107	237	64	570	56	626	315	584	52	636	160
West Virginia	82	38	44	6	186	.....	186	87	121	.....	121	37
Wisconsin	1,000	115	500	40	2,212	78	2,290	268	1,394	83	1,477	169
Wyoming	56	19	54	11	154	8	162	73	104	12	116	59
U.S. Government	11	7	17	45	20	.....	20	276	43	.....	43	296
Miscellaneous‡	25	125	13	69	34	1	35	379	130	.....	130	235
TOTAL	**20,181**	**4,191**	**10,671**	**2,212**	**51,247**	**3,481**	**54,728**	**13,092**	**35,089**	**3,506**	**38,595**	**9,018**

Data released June 25, 1980, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; International Harvester; Long; Massey-Ferguson; R. M. Wade (Satoh); Steiger; Versatile; and White.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revision reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

RETAIL SALES OF SELECTED FARM EQUIPMENT— Jan.-Apr., 1979 and 1980(1)

(In units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled Power Units		Windrowers Self-Propelled Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980
Alabama	54	42	16	7	28	20	.....	2	.....	1	108	68	6	3
Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	9	15	.....	.....	7	6	17	22	19	30	4	4	4	2
Arkansas	114	95	1	.....	59	45	2	.....	1	.....	23	38	2	2
California	16	70	5	6	48	32	76	88	84	103	8	.....	14	19
Colorado	30	45	11	19	44	30	43	27	47	29	39	36	14	17
Connecticut	.....	.....	.....	.....	8	12	.....	.....	.....	.....	1	.....	6	6
Delaware	4	6	2	3	1	1	.....	1	.....	1	5	6	2	1
Florida	16	13	14	5	19	18	.....	.....	.....	.....	29	23	2	9
Georgia	78	60	48	50	32	16	.....	1	.....	1	234	143	10	12
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Idaho	37	32	3	3	53	69	27	44	26	42	23	24	3	10
Illinois	690	473	518	480	66	51	1	4	1	4	355	253	64	50
Indiana	421	322	310	312	84	37	.....	4	.....	4	317	189	37	39
Iowa	720	600	411	555	87	57	45	17	44	17	1,151	657	77	121
Kansas	341	439	38	58	107	73	97	60	97	58	183	124	20	49
Kentucky	105	56	49	31	76	41	2	1	2	1	193	184	18	29
Louisiana	77	45	.....	.....	24	8	.....	.....	.....	.....	8	7	.....	5
Maine	1	.....	.....	.....	10	4	.....	.....	.....	.....	.....	.....	8	8
Maryland	18	27	15	20	23	19	1	4	1	4	24	15	10	17
Massachusetts	.....	.....	.....	.....	5	6	.....	.....	.....	.....	1	.....	.....	1
Michigan	94	94	60	82	65	38	13	6	13	6	124	104	51	67
Minnesota	344	265	178	218	181	144	137	63	140	62	480	297	118	110
Mississippi	110	73	2	.....	29	13	.....	.....	.....	.....	30	16	9	11
Missouri	215	202	101	111	122	78	24	11	23	11	355	273	31	21
Montana	42	65	1	2	65	42	42	57	43	58	36	31	2	8
Nebraska	269	337	139	257	54	31	94	56	93	52	337	293	34	52
Nevada	.....	1	.....	.....	7	10	8	8	7	9	1	2	1	1
New Hampshire	.....	.....	.....	.....	6	9	.....	.....	.....	.....	1	.....	3	5
New Jersey	12	6	5	7	18	3	.....	.....	.....	.....	11	4	3	4
New Mexico	3	4	.....	2	25	14	21	9	20	9	10	4	.....	.....
New York	20	25	18	35	116	101	11	9	11	10	49	59	68	107
North Carolina	72	50	49	44	40	40	3	.....	3	.....	117	81	12	11
North Dakota	203	165	5	7	7	11	116	43	121	45	88	64	13	15
Ohio	306	293	210	197	151	76	2	3	2	3	295	202	40	48
Oklahoma	112	145	.....	2	227	91	31	18	34	18	83	59	6	5
Oregon	21	24	.....	3	57	54	45	30	42	31	21	16	14	6
Pennsylvania	39	37	35	46	195	135	13	5	13	7	170	138	66	100
Rhode Island	.....	....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....
South Carolina	51	41	22	16	14	14	.....	.....	.....	.....	55	30	3	7
South Dakota	84	92	45	52	18	19	148	60	152	64	202	182	32	39
Tennessee	104	65	26	33	128	65	.....	1	.....	1	135	94	22	21
Texas	113	164	27	22	253	104	22	10	26	9	122	105	15	23
Utah	5	4	.....	1	31	35	14	19	15	19	44	18	4	9
Vermont	.....	.....	.....	.....	19	16	.....	.....	.....	.....	2	1	15	25
Virginia	35	26	32	18	87	67	.....	3	.....	3	79	48	22	38
Washington	67	51	4	6	55	48	24	29	25	25	12	11	14	15
West Virginia	1	.....	2	.....	36	26	.....	.....	.....	.....	13	14	7	.....
Wisconsin	42	89	58	113	382	305	59	67	61	66	308	255	247	367
Wyoming	5	9	2	1	38	18	25	14	25	15	14	5	5	3
U.S. Government	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTAL	**5,100**	**4,667**	**2,462**	**2,824**	**3,208**	**2,152**	**1,163**	**796**	**1,191**	**818**	**5,901**	**4,177**	**1,154**	**1,520**

Data released June 25, 1980, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.

(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types		Manure Spreaders Conveyor-Type		
1979	1980	1979	1980	
34	17	7	12	Alabama
.....	.....	.....	.....	Alaska
2	2	3	4	Arizona
96	65	50	50	Arkansas
14	10	29	19	California
17	12	37	31	Colorado
15	12	41	31	Connecticut
2	4	35	41	Delaware
17	13	11	10	Florida
38	53	26	19	Georgia
1	.....	1	.....	Hawaii
9	19	62	50	Idaho
131	83	532	296	Illinois
145	79	393	216	Indiana
294	157	1,428	691	Iowa
177	114	127	109	Kansas
194	169	185	129	Kentucky
18	12	12	9	Louisiana
18	11	45	38	Maine
37	16	112	113	Maryland
7	11	38	30	Massachusetts
97	74	393	343	Michigan
235	178	888	589	Minnesota
20	12	13	8	Mississippi
380	302	234	155	Missouri
10	18	24	17	Montana
112	112	310	213	Nebraska
1	2	2	.....	Nevada
4	10	15	24	New Hampshire
10	9	29	23	New Jersey
3	2	3	3	New Mexico
147	149	661	607	New York
53	54	77	75	North Carolina
21	12	24	32	North Dakota
256	151	538	415	Ohio
236	121	19	25	Oklahoma
30	37	41	40	Oregon
231	182	713	632	Pennsylvania
1	1	.....	.....	Rhode Island
24	13	15	15	South Carolina
20	17	130	90	South Dakota
171	119	100	85	Tennessee
255	178	72	67	Texas
11	17	50	55	Utah
24	24	115	89	Vermont
118	153	115	115	Virginia
20	26	72	64	Washington
41	29	46	30	West Virginia
467	374	1,375	947	Wisconsin
2	3	24	16	Wyoming
.....	.....	.....	.....	U.S. Government
.....	.....	.....	.....	Miscellaneous
4,266	**3,238**	**9,272**	**6,677**	**TOTAL**

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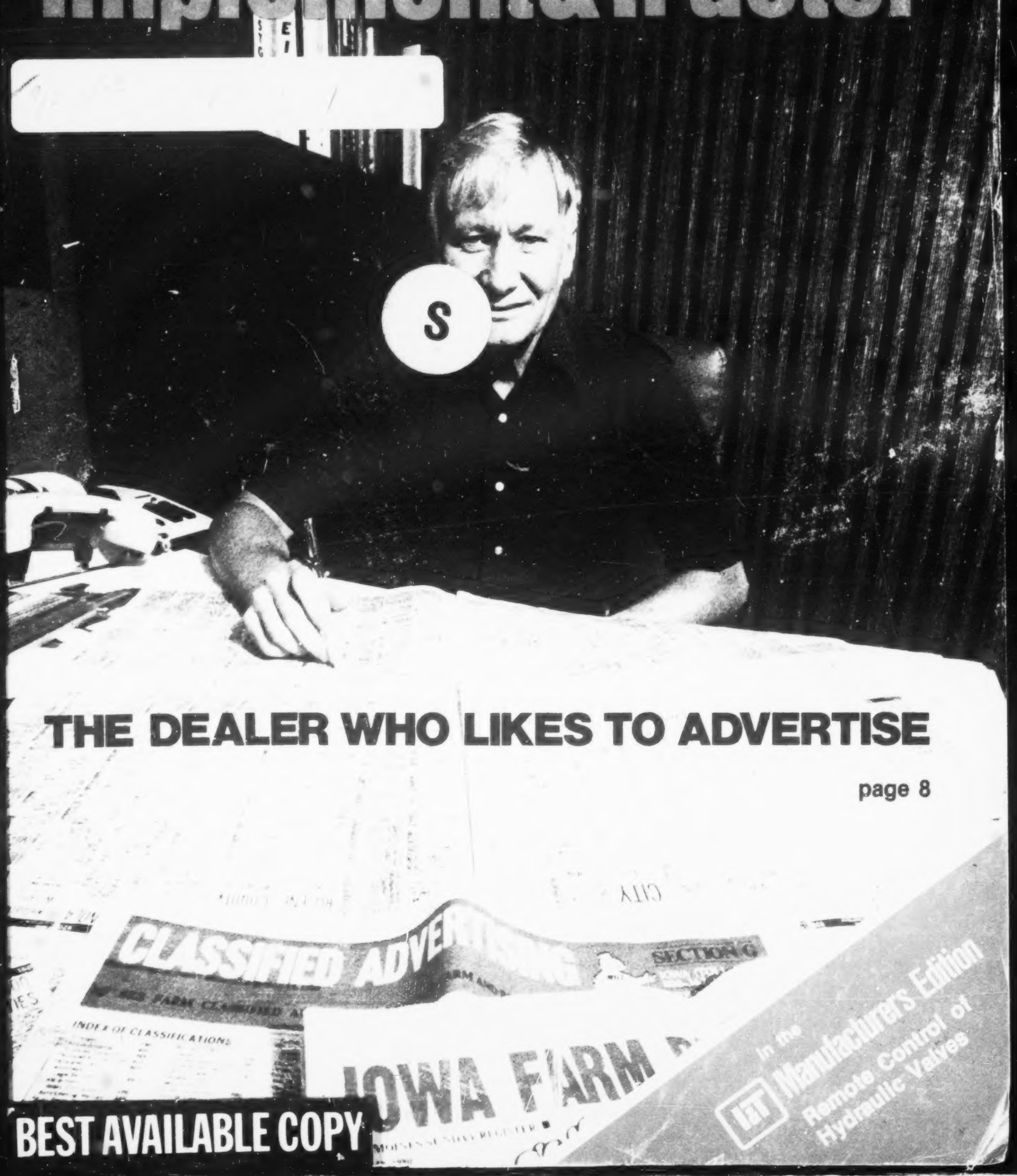
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September 7, 1980 • Vol. 95 • No. 18

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

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19: **Tractor Superchargers: Pressure-Wave of the Future?** I&T takes a look at the Comprex Pressure-Wave supercharger which is being used on a new model tractor for the European market.

26: **Glossary for the Electronics Age.** As tractor and implement control systems become more sophisticated, it is time to learn the language of electronics.

32: **Aug. 1 Combine Auction: Prices Reflect Turnaround.** Prices paid at a central Iowa auction of combines and cornheads reflect crop conditions and regional economies. Second in a two-part series.

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what's ahead...

I&T
SINCE 1886

September 7, 1980

A STRONG COMEBACK IN U.S. TRACTOR RETAIL SALES was posted by dealers in July, according to the FIEI flash report. Unit volume for the month was almost 20 per cent ahead of last year, with the improvement coming strongest in the area that needed it most--tractors over 100 hp. The sales level for the first seven months, however, is behind the 1979 pace by a substantial 21 per cent. In May, FIEI's Marketing & Management Conference was saying the industry would finish the year down about 11 per cent; specifically, 2WD units under 30 hp, off 7.6 per cent; 2WDs from 30-99 hp, down 10 per cent; 2WDs over 100 hp, off 13.6 per cent; 4WD tractors, off 10.5 per cent. Meanwhile, combines, conventional balers, forage harvesters and mower-conditioners had a much rougher month. The flash report:

Unit Retail Sales

	July			January-July		
Equipment	1980	1979	Pct. Change	1980	1979	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-99 hp	6,154	5,080	+21.1	36,909	42,028	-12.2
100 hp & over	3,373	2,726	+23.7	27,295	39,685	-31.2
Total 2-wheel dr.	9,527	7,806	+22.0	64,204	81,713	-21.4
4-wheel drive	603	666	- 9.5	5,634	6,445	-12.6
Total Tractors	10,130	8,472	+19.6	69,838	88,158	-20.8
S-P Combines	2,395	2,972	-19.4	9,495	11,215	-15.3
Balers*	3,040	3,751	-19.0	8,867	12,214	-27.4
Forage Harvesters**	975	1,206	-19.2	3,763	4,380	-14.1
Mower-Conditioners	3,235	3,620	-10.6	12,670	17,382	-27.1

*Bales under 200 lbs. **Shear-bar type

EARLY IN 1981, FORD TRACTOR DEALERS will begin marketing an expanded line of self-propelled grain combines, in accordance with an agreement signed by Ford Tractor Operations and Claas of America. Claas is a subsidiary of Claas OHG of Harsewinkel, West Germany, which is a leading European combine maker and has been supplying Ford Tractor in the U.S. with a line of combines for the past 15 years. Under the new agreement, says Ford, its dealers will have North American marketing rights to the line. Initially, there will be two Claas models, the Dominator 96 and the Dominator 76, painted Ford blue, with other models to be added later, probably including a rotary-type unit. Biggest model in the Claas line is the Dominator 106, with a 205-hp diesel engine, which has been under test in the U.S. for over two years. Claas of America is located at 421 Stevenson Highway, Troy, Mich. 48084; Thomas G. S. Leask is president and James Johnson, formerly with White Farm, is vice-president for marketing.

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RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-May, 1979				Cumulative for Jan.-May, 1980			
	May 1979		May 1980		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	226	66	219	41	1,439	22	1,461	293	1,090	36	1,126	175
Alaska	1	4	9	8	3	.....	3	18	8	5	13	11
Arizona	55	52	112	33	327	40	367	273	375	47	422	198
Arkansas	301	91	267	46	1,817	119	1,936	272	1,464	186	1,650	234
California	421	303	317	203	2,025	133	2,158	1,571	1,744	131	1,875	1,099
Colorado	110	82	98	51	484	78	562	306	411	86	497	253
Connecticut	21	27	26	11	82	.....	82	128	109	3	112	85
Delaware	16	5	15	5	106	10	116	21	79	4	83	15
Florida	146	172	217	79	879	29	908	755	941	29	970	506
Georgia	294	78	307	54	2,045	21	2,066	407	1,430	27	1,457	205
Hawaii	2	7	8	7	27	.....	27	44	25	.....	25	50
Idaho	100	21	82	9	488	72	560	86	409	42	451	63
Illinois	529	133	455	63	3,595	381	3,976	678	2,082	349	2,431	315
Indiana	421	162	279	42	2,198	213	2,411	432	1,221	200	1,421	219
Iowa	694	41	346	50	4,891	309	5,200	189	2,489	258	2,747	141
Kansas	396	38	322	26	1,808	237	2,045	153	1,255	294	1,549	158
Kentucky	407	107	433	76	2,325	47	2,372	333	1,712	39	1,751	178
Louisiana	204	104	252	41	1,169	84	1,253	390	1,131	121	1,252	254
Maine	29	19	31	3	94	.....	94	65	82	2	84	48
Maryland	83	51	78	30	407	18	425	218	319	23	342	126
Massachusetts	23	31	17	22	69	.....	69	142	51	.....	51	101
Michigan	239	150	229	64	1,375	117	1,492	579	914	94	1,008	339
Minnesota	955	84	331	26	3,098	457	3,555	325	1,527	280	1,807	172
Mississippi	291	63	293	29	1,731	75	1,806	343	1,481	124	1,605	135
Missouri	527	108	347	45	2,658	121	2,779	415	1,611	127	1,738	265
Montana	168	37	120	18	416	227	643	95	457	129	586	92
Nebraska	434	28	197	10	2,434	159	2,593	107	1,465	183	1,648	71
Nevada	18	27	15	8	67	3	70	92	50	7	57	51
New Hampshire	17	9	7	2	49	.....	49	54	45	.....	45	30
New Jersey	36	70	27	37	159	3	162	291	131	1	132	192
New Mexico	47	24	38	20	224	16	240	128	194	10	204	89
New York	288	120	239	98	1,116	54	1,170	503	911	38	949	374
North Carolina	298	88	352	47	2,208	39	2,247	478	1,524	20	1,544	262
North Dakota	565	39	139	17	1,283	633	1,916	106	606	344	950	55
Ohio	448	210	341	71	2,248	172	2,420	700	1,580	164	1,744	345
Oklahoma	298	74	210	50	1,311	122	1,433	282	911	139	1,050	232
Oregon	128	61	103	21	516	27	543	251	474	33	507	171
Pennsylvania	254	158	219	82	1,081	19	1,100	654	867	27	894	432
Rhode Island	6	3	1	3	11	.....	11	21	6	.....	6	21
South Carolina	165	49	160	34	993	19	1,012	219	716	24	740	133
South Dakota	353	41	87	10	1,255	169	1,424	96	624	109	733	43
Tennessee	321	67	345	21	2,126	41	2,167	428	1,351	45	1,396	159
Texas	762	418	858	248	4,112	198	4,310	1,742	3,762	248	4,010	1,489
Utah	65	54	63	20	290	6	296	183	235	14	249	131
Vermont	40	7	32	7	140	3	143	22	96	.....	96	13
Virginia	230	70	232	38	1,178	5	1,183	356	926	14	940	258
Washington	166	81	150	44	705	87	792	392	718	68	786	204
West Virginia	55	19	62	54	241	.....	241	106	183	.....	183	91
Wisconsin	735	85	438	26	2,911	113	3,024	353	1,815	100	1,915	195
Wyoming	58	34	36	8	208	12	220	107	136	16	152	67
U.S. Government	5	159	8	60	25	.....	25	435	51	.....	51	356
Miscellaneous‡	.....	175	48	126	34	1	35	554	178	.....	178	361
TOTAL	**12,471**	**4,207**	**9,617**	**2,244**	**62,481**	**4,711**	**67,192**	**17,192**	**43,972**	**4,240**	**48,212**	**11,262**

Data released July 24, 1980, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland Satoh); Allis-Chalmers, Belarus; J I Case; Deere; Deutz; Ford; International Harvester; Long; Massey-Ferguson; R. M. Wade (Satoh); Steiger; Versatile; and White.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

RETAIL SALES OF SELECTED FARM EQUIPMENT — Jan.-May, 1979 and 1980 (1)

(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled Power Units		Windrowers Self-Propelled Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980
Alabama	58	50	19	15	49	35	.....	2	.....	1	132	79	14	5
Alaska	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	13	23	.....	.....	10	17	21	30	23	38	4	5	4	2
Arkansas	129	115	1	.....	111	68	2	.....	1	.....	32	46	3	2
California	23	80	9	6	63	54	98	124	111	141	9	1	24	25
Colorado	51	59	16	28	55	64	57	52	62	57	43	37	20	21
Connecticut	.....	.....	.....	.....	9	16	.....	.....	.....	.....	2	.....	9	8
Delaware	6	9	4	4	4	2	.....	1	.....	1	5	6	2	3
Florida	18	17	15	8	30	25	1	.....	1	.....	37	24	5	12
Georgia	118	84	69	60	60	38	1	1	1	1	285	160	20	22
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Idaho	48	44	3	3	80	97	45	65	45	65	23	31	4	14
Illinois	730	553	555	551	86	72	2	9	2	9	404	293	71	71
Indiana	444	354	340	350	110	63	1	5	1	5	387	219	49	52
Iowa	761	671	449	640	106	68	65	26	64	27	1,372	722	107	133
Kansas	492	591	43	92	185	110	149	110	150	109	206	140	38	72
Kentucky	120	66	59	36	129	64	2	2	2	2	204	206	31	42
Louisiana	88	56	.....	.....	43	14	.....	.....	.....	.....	10	10	1	6
Maine	1	.....	.....	.....	17	9	.....	.....	.....	.....	1	.....	11	9
Maryland	20	33	16	26	39	29	4	7	4	6	25	19	17	22
Massachusetts	.....	.....	.....	.....	10	7	.....	.....	.....	.....	1	1	2	3
Michigan	105	110	69	93	78	64	20	9	20	9	149	126	64	83
Minnesota	418	295	247	230	246	177	176	88	179	91	587	331	154	140
Mississippi	130	94	2	1	60	27	.....	.....	.....	.....	33	22	16	15
Missouri	240	236	113	132	200	121	33	18	33	18	413	299	47	30
Montana	56	84	1	2	87	61	64	77	65	77	44	39	4	10
Nebraska	308	359	161	289	75	41	148	89	148	87	389	313	46	68
Nevada	.....	1	.....	.....	13	13	16	12	19	15	1	2	2	3
New Hampshire	.....	.....	.....	.....	7	14	.....	.....	.....	.....	1	.....	3	6
New Jersey	12	6	5	7	23	9	.....	.....	.....	.....	11	4	4	5
New Mexico	4	5	.....	2	39	35	34	22	33	24	14	7	1	.....
New York	22	30	26	39	151	134	14	13	14	14	69	71	106	147
North Carolina	91	69	56	56	79	72	3	1	3	1	137	85	18	18
North Dakota	267	196	6	10	10	14	181	51	188	54	105	73	15	21
Ohio	336	327	236	225	193	110	6	3	6	3	325	242	47	67
Oklahoma	183	180	1	2	365	138	76	33	77	34	98	71	12	9
Oregon	37	35	.....	3	75	88	62	44	63	45	22	18	20	10
Pennsylvania	49	38	39	59	270	182	21	14	21	16	206	162	90	123
Rhode Island	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	1	.....	.....	.....
South Carolina	58	49	27	19	34	21	.....	.....	.....	.....	69	41	9	11
South Dakota	119	111	56	60	25	22	210	91	219	101	245	198	41	47
Tennessee	116	73	29	36	203	104	.....	1	.....	1	154	111	44	30
Texas	187	271	39	41	419	168	39	22	45	23	146	122	24	32
Utah	5	6	.....	1	47	50	17	24	18	24	54	21	10	14
Vermont	.....	.....	.....	.....	22	29	.....	1	.....	1	2	.....	19	36
Virginia	44	32	38	24	152	115	2	3	2	3	93	59	34	42
Washington	74	66	6	8	69	83	47	46	45	43	13	12	24	29
West Virginia	1	.....	2	.....	54	35	.....	.....	.....	.....	16	16	8	2
Wisconsin	54	99	71	126	502	384	89	97	91	97	383	304	345	479
Wyoming	8	10	2	1	43	26	28	19	30	18	17	12	6	3
U.S. Government	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTAL	6,045	5,587	2,830	3,285	4,739	3,195	1,734	1,212	1,786	1,261	6,979	4,760	1,645	2,006

Data released July 24, 1980, Farm & Industrial Equipment Institute.

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(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types		Manure Spreaders Conveyor-Type		
1979	1980	1979	1980	
70	40	10	13	Alabama
.....	.....	.....	.....	Alaska
3	5	4	6	Arizona
181	103	70	61	Arkansas
24	18	40	21	California
20	22	46	40	Colorado
16	20	52	38	Connecticut
7	7	41	43	Delaware
28	21	13	11	Florida
85	87	30	24	Georgia
1	.....	1	1	Hawaii
13	23	75	59	Idaho
195	134	659	357	Illinois
217	123	465	271	Indiana
393	220	1,663	777	Iowa
323	173	169	136	Kansas
372	239	221	180	Kentucky
31	18	16	12	Louisiana
25	19	78	55	Maine
61	28	137	137	Maryland
12	16	43	38	Massachusetts
149	124	491	409	Michigan
359	246	1,159	698	Minnesota
54	26	20	8	Mississippi
623	440	305	201	Missouri
16	27	34	28	Montana
150	138	383	247	Nebraska
3	2	2	5	Nevada
7	16	29	33	New Hampshire
20	18	35	28	New Jersey
6	4	3	3	New Mexico
211	242	866	740	New York
140	89	100	89	North Carolina
32	17	52	49	North Dakota
363	210	672	486	Ohio
393	203	20	33	Oklahoma
46	50	63	49	Oregon
325	251	860	743	Pennsylvania
3	1	1	.....	Rhode Island
57	27	23	20	South Carolina
31	25	204	114	South Dakota
348	192	121	107	Tennessee
465	291	87	82	Texas
19	31	58	70	Utah
33	51	162	115	Vermont
231	263	150	136	Virginia
34	45	89	74	Washington
60	47	63	36	West Virginia
670	567	1,837	1,141	Wisconsin
2	7	37	27	Wyoming
.....	.....	.....	.....	U.S. Government
.....	.....	.....	.....	Miscellaneous
6,927	**4,966**	**11,759**	**8,051**	**TOTAL**

I&T
SINCE 1886

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

YODER & FREY, INC.
Archbold, Ohio
(August 12, 1980)

ALLIS-CHALMERS TRACTORS

5050, 1977 (Excellent)	3500*
190, 1967 (Fair)	3900*
180, 1967 (Rough)	3750
D17 diesel, 1963 (Fair)	1635
D17 diesel, 1962 (Rough)	1200
WD45, 1956 (Rough)	600
WD45, 1956 (Rough)	460*

DAVID BROWN TRACTORS

1200, 1966 (Fair)	3300
1200, 1966 (Fair)	3075
1200, 1960 (Fair)	2675
950, 1955 (Fair)	775
885 diesel, 1977 (Excellent)	4200*

CASE TRACTORS

1200 diesel, 1965 (Rough)	9500*
1070 diesel, 1973 (Rough)	5000*
830 diesel, 1962 (Fair)	3250
830 diesel, 1962 (Rough)	875*
830 diesel, 1961 (Fair)	1500*
730 diesel, 1963 (Fair)	2800*
730 diesel, 1963 (Rough)	1450
730, 1962 (Rough)	1000*
530, ldr., 1964 (Good)	3700

COCKSHUTT TRACTOR

1600, 1962 (Good)	2300

JOHN DEERE TRACTORS

4440 diesel, 1979 (Excellent)	24,000*
4430 diesel, 1976 (Good)	15,750
4020 diesel, duals, 1967 (Good)	6700
4020, 1967 (Good)	4000
4020, 1965 (Fair)	4100*
4020, 1965 (Fair)	4000
4010 diesel, 1961 (Fair)	4700*
3020 diesel, 1964 (Good)	5525
3010, 1960 (Good)	3225
2510, 1967 (Fair)	3175
2510, 1967 (Fair)	2650*
2030, ldr., 1974 (Good)	4600*
720, 1956 (Fair)	1200*
630, 1959 (Good)	1800*
530, 1959 (Good)	1475
420, ldr., 1956 (Fair)	1300
70, 1954 (Fair)	1050*
60, 1954 (Good)	1050
60, 1954 (Good)	825
40, 1953 (Fair)	1050*
B, 1947 (Rough)	300*

FERGUSON TRACTORS

30, ldr., 1952 (Fair)	1100*
30,	660
T030, (Rough)	530*
20,	1100
20, 1948 (Fair)	800*

FORD TRACTORS

5000, 1972 (Fair)	4975
4000, ldr., 1970 (Fair)	4100*
4000, 1960 (Good)	1925
3000 diesel, 1972 (Good)	4400*
3000, 1971 (Fair)	2850
801, 1956 (Fair)	1600
800, 1956 (Fair)	1450*
541, 1954 (Fair)	1375*
NAA, 1953 (Fair)	1310
8N, 1952 (Good)	1550*
8N, 1950 (Good)	1350
8N, 1950 (Fair)	1150*
8N, 1950 (Rough)	700
8N, 1950 (Rough)	670*
8N, ldr., 1949 (Fair)	1225
9N, ldr., 1946 (Fair)	770
9N, 1944 (Good)	1200
9N, mo., 1944 (Rough)	700
9N, 1943 (Rough)	650*

INTERNATIONAL HARVESTER TRACTORS

2504, ldr., 1968 (Fair)	3000*
1468, 1975 (Good)	9400
1206 diesel, 1964 (Good)	5000
806, 1964 (Good)	4000*
574 diesel, 1971 (Fair)	3600
504, 1962 (Fair)	1750*
460, 1961 (Fair)	1600*
460, 1961 (Fair)	725
454, 1974 (Good)	3800*
450, 1956 (Fair)	1050*
350, 1957 (Rough)	820*
250, ldr., 1958 (Fair)	1250*
Sup. M, 1953 (Rough)	650*
Sup. M, 1950 (Fair)	850
M, 1953 (Fair)	500
M, 1952 (Rough)	450*
M, 1951 (Fair)	720*
M, 1950 (Rough)	460*
H, 1948 (Rough)	310*
H, 1944 (Rough)	325
140, mo., 1963 (Good)	2200
A, cult., 1950 (Fair)	550
C, cult., 1952 (Fair)	735
Cub, mo., 1956 (Rough)	975*

MASSEY-FERGUSON TRACTORS

1800, 1974 (Good)	10,300*
1080 diesel, 1971 (Good)	4000
1080 diesel, 1970 (Rough)	3500*
180, 1970 (Good)	4300
180, duals, 1970 (Rough)	2900*
85, 1960 (Rough)	1300*
65 diesel, 1960 (Fair)	2225
50 diesel,	1775

MINNEAPOLIS-MOLINE TRACTORS

G1000, 1970 (Rough)	2850
Jet Star 3, 1959 (Good)	2000
Z, cult.,	475

OLIVER TRACTORS

2150 diesel, 1974 (Fair)	8000*
1900, 1962 (Fair)	2900*
1855 diesel, 1971 (Fair)	5100
1800, 1962 (Fair)	1850*
880 diesel, 1963 (Fair)	800
660, 1961 (Rough)	725
770 diesel, 1960 (Fair)	1400*
770, 1960 (Fair)	625*
770, 1960 (Rough)	600
770, 1959 (Fair)	1650
550 diesel, ldr., 1961 (Fair)	2100
88 diesel, ldr., 1949 (Rough)	1000*
77, 1950 (Fair)	560

NOTES
Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.
Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

SEPT

21

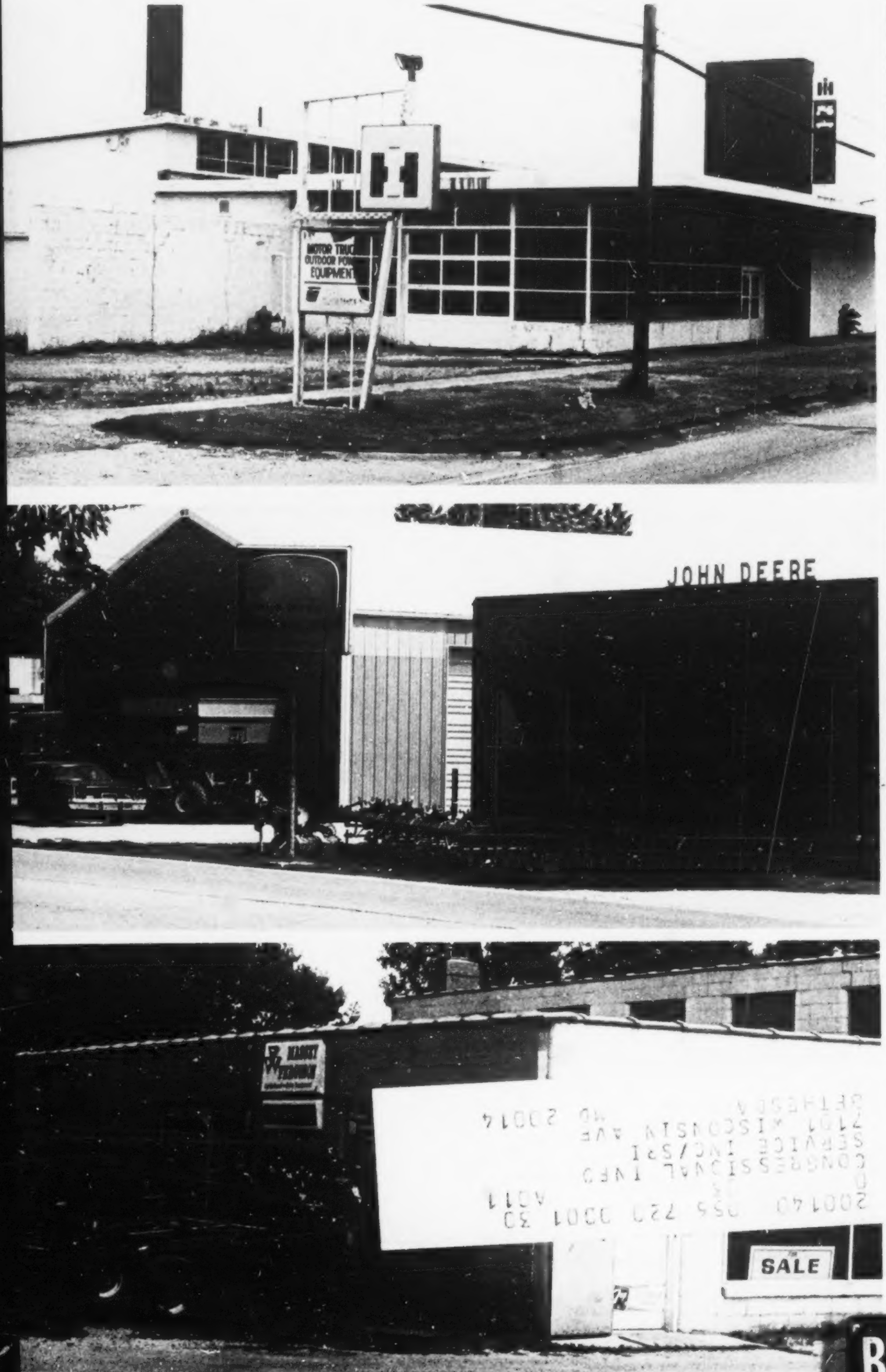
1980

10/1/80 C 4725-1

September 21, 1980
TWO DOLLARS

Serving the Farm and Industrial Equipment Industry Since 1886

Implement & Tractor


MOTOR TRUCKS
OUTDOOR POWER
EQUIPMENT
JOHN DEERE
SALE

Think this is a static business?

HOW THINGS CHANGED IN STREATOR

page 6

Dealers elect Lloyd Summa president

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September 21, 1980 • Vol. 95 • No. 19

Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

6: How Things Changed in Streator. The farm equipment business recession was not the main reason this Illinois farming community lost dealership representation for IH, Massey-Ferguson and John Deere.

12: NFPEDA in Las Vegas: The Name Stays the Same. Convention participants defeat a proposal to change the name of the National Farm & Power Equipment Dealers Assn. but approve a by-law change which broadens the purpose of the organization. Lloyd Summa is elected president.

SUMMA COUNTRY

22: Ridge Tractor vs. Deere: Jury Finds for Dealer. A U.S. District Court jury in Greenville, S.C., rules in favor of a dealer who alleged a wrongful termination of his franchise.

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(In Units)

	Combines Self-Propelled		Corn Heads		Hay Balers (2)		Windrowers Self-Propelled Power Units		Windrowers Self-Propelled Total Heads		Grinder-Mixers		Shear-Bar Forage Harvesters (3)	
	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980	1979	1980
Alabama	91	81	23	17	92	69	.....	2	.....	1	137	86	20	6
Alaska	.....	.....	.....	.....	2	7	.....	.....	.....	.....	.....	1	.....	.....
Arizona	16	32	.....	.....	14	25	30	39	33	48	4	5	6	5
Arkansas	176	158	1	.....	169	116	2	.....	1	.....	39	47	8	3
California	79	118	16	7	68	87	133	161	150	180	9	2	29	30
Colorado	101	100	22	33	109	136	117	92	124	99	47	39	24	26
Connecticut	.....	.....	.....	.....	17	28	.....	.....	.....	.....	2	.....	10	8
Delaware	9	11	6	5	5	4	.....	1	.....	1	7	7	3	5
Florida	25	21	19	13	40	31	1	.....	2	.....	41	27	5	13
Georgia	188	140	102	83	95	81	1	1	1	1	323	170	32	30
Hawaii	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Idaho	78	58	3	7	122	216	135	150	136	152	24	34	13	26
Illinois	891	636	665	613	152	154	8	10	8	10	448	306	124	94
Indiana	552	399	441	400	174	129	5	6	5	6	412	225	81	75
Iowa	853	744	537	724	172	127	136	66	138	66	1,462	747	255	180
Kansas	779	816	62	106	246	168	233	169	238	170	228	145	85	88
Kentucky	157	83	77	45	202	163	2	3	2	3	226	212	46	51
Louisiana	112	68	.....	1	56	20	.....	.....	.....	.....	12	12	4	9
Maine	1	2	.....	.....	21	20	.....	.....	.....	.....	1	.....	18	12
Maryland	28	41	17	41	50	48	8	8	7	7	29	25	24	28
Massachusetts	.....	.....	.....	.....	20	16	.....	.....	.....	.....	1	1	6	4
Michigan	150	120	94	101	161	124	34	23	37	23	170	148	158	116
Minnesota	512	335	330	261	358	308	307	191	315	197	649	350	322	228
Mississippi	157	126	3	1	78	35	.....	.....	.....	.....	35	24	17	18
Missouri	319	303	136	151	319	238	58	29	57	30	452	324	73	39
Montana	84	120	2	2	165	100	161	120	162	127	52	42	11	11
Nebraska	383	417	188	330	112	75	300	153	300	156	424	327	105	94
Nevada	.....	1	.....	.....	15	17	31	23	34	26	1	2	2	7
New Hampshire	.....	.....	.....	.....	12	21	.....	.....	.....	.....	2	.....	7	7
New Jersey	12	7	5	7	32	16	.....	.....	.....	.....	11	4	5	6
New Mexico	8	10	.....	2	62	54	48	29	48	31	15	8	2	.....
New York	30	33	41	51	212	251	33	26	33	27	74	76	202	208
North Carolina	141	96	74	80	135	160	3	2	3	2	159	91	26	22
North Dakota	358	251	7	13	23	17	316	83	323	89	127	82	20	26
Ohio	468	362	321	262	270	208	7	4	7	4	362	248	90	90
Oklahoma	318	306	2	4	451	215	104	58	108	64	105	78	23	13
Oregon	55	51	.....	3	145	157	109	106	109	109	25	19	34	15
Pennsylvania	68	49	50	69	371	307	40	28	41	30	222	180	184	176
Rhode Island	.....	.....	.....	.....	2	2	.....	.....	.....	.....	1	.....	.....	1
South Carolina	90	65	33	27	53	37	.....	.....	.....	.....	73	43	12	11
South Dakota	145	148	67	67	43	32	396	152	419	166	260	207	78	58
Tennessee	157	109	34	47	317	271	.....	1	.....	1	174	122	62	36
Texas	367	418	64	69	612	304	59	39	66	44	166	127	33	41
Utah	6	7	.....	1	95	134	59	47	59	46	55	21	19	18
Vermont	....	.....	.....	.....	38	45	.....	1	.....	1	2	.....	38	46
Virginia	63	42	50	31	235	231	4	4	4	4	104	61	49	58
Washington	128	99	10	9	101	178	103	87	106	82	15	12	43	49
West Virginia	1	.....	2	.....	118	68	.....	.....	.....	.....	17	17	8	2
Wisconsin	70	105	83	139	706	620	185	184	187	182	432	325	751	696
Wyoming	16	13	2	1	45	46	60	56	61	57	18	13	7	6
U.S. Government	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous (4)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....
TOTAL	**8,243**	**7,101**	**3,589**	**3,824**	**7,112**	**5,916**	**3,228**	**2,154**	**3,324**	**2,242**	**7,659**	**5,042**	**3,174**	**2,793**

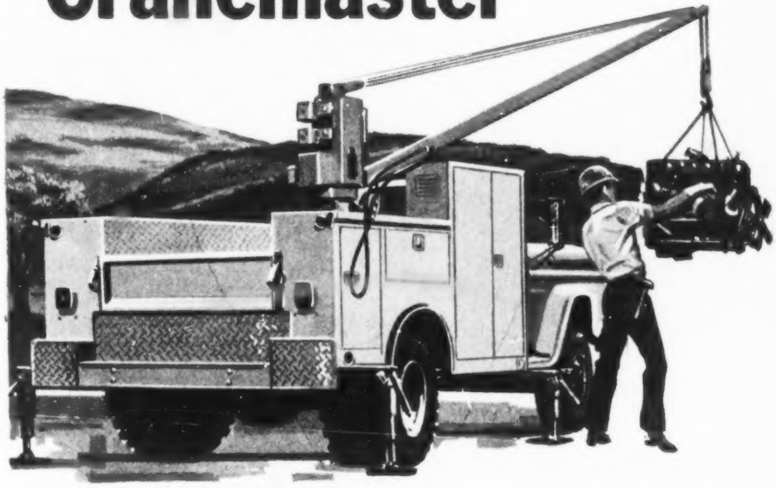
Data released August 25, 1980, Farm & Industrial Equipment Institute.

(1) Includes revisions for prior months.
(2) For making bales of under 200 lbs.
(3) Pull-type, mounted, self-propelled.
(4) Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

Mower Conditioners All Types		Manure Spreaders Conveyor-Type		
1979	1980	1979	1980	
137	77	11	13	Alabama
.....	1	.....	.....	Alaska
4	6	6	6	Arizona
348	221	80	66	Arkansas
33	24	49	24	California
61	60	53	47	Colorado
38	44	58	44	Connecticut
9	10	47	43	Delaware
39	24	16	15	Florida
153	137	32	24	Georgia
1	.....	1	1	Hawaii
45	54	77	65	Idaho
453	296	716	377	Illinois
416	242	503	295	Indiana
856	479	1,785	814	Iowa
566	303	185	139	Kansas
759	484	236	197	Kentucky
60	23	17	16	Louisiana
54	33	89	61	Maine
98	53	145	145	Maryland
38	25	49	45	Massachusetts
359	263	555	456	Michigan
786	471	1,286	754	Minnesota
84	40	20	8	Mississippi
1,147	735	340	217	Missouri
45	41	35	31	Montana
360	242	413	262	Nebraska
4	2	2	5	Nevada
19	33	37	38	New Hampshire
37	28	39	31	New Jersey
8	9	3	3	New Mexico
504	475	941	794	New York
246	143	110	92	North Carolina
73	29	71	57	North Dakota
654	389	722	515	Ohio
574	344	24	37	Oklahoma
110	124	74	63	Oregon
598	452	926	786	Pennsylvania
3	2	1	.....	Rhode Island
89	45	24	21	South Carolina
88	30	239	126	South Dakota
606	370	135	121	Tennessee
833	596	91	93	Texas
78	75	66	76	Utah
96	84	180	135	Vermont
474	464	159	148	Virginia
92	127	98	84	Washington
125	95	68	38	West Virginia
1,486	1,141	2,047	1,232	Wisconsin
16	14	37	28	Wyoming
.....	.....	.....	.....	U.S. Government
.....	.....	.....	.....	Miscellaneous
13,762	**9,459**	**12,898**	**8,688**	**TOTAL**

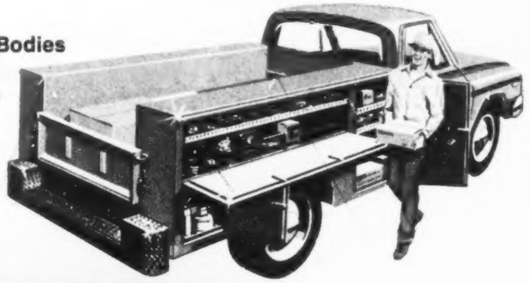
Job-planned for routine and emergency field maintenance!

Reading Cranemaster



Cranemaster is the job-planned rugged crane body made stronger to last longer. Mount a field service crane on this heavy duty steel body, load a full supply of replacement parts and tools in its job-planned compartments, and you're ready for every service call. Gas bottles are carried in a vented compartment. A steel sliding tray gives you easy access to your mechanic's tool box. Compartment tops and cargo area sides are armored with safety tread plate steel. The rugged steel body panels and U-girder understructure are fully electric welded into one integral unit to resist road-shock on any terrain.

Reading Service Bodies are available in steel or aluminum for full size or compact chassis.



Reading all-steel stake bodies are designed, engineered and built to haul and deliver every cargo without strain.

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See your truck dealer or write for name of nearest distributor.
Reading Body Works, Inc., P. O. Box 14, Reading, PA 19603.

Circle (9) on Reply Card

RETAIL SALES OF WHEEL TRACTORS*

(In Units)

	Total Wheel Tractors†				Cumulative for Jan.-June, 1979				Cumulative for Jan.-June, 1980			
	June, 1979		June, 1980		Farm Type				Farm Type			
	Farm	Non-Farm	Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm	2-Wheel Drive	4-Wheel Drive	Total Farm	Non-Farm
Alabama	239	65	226	33	1,673	27	1,700	358	1,303	49	1,352	208
Alaska	5	5	3	2	8	.....	8	23	10	6	16	13
Arizona	50	70	54	36	372	45	417	343	418	58	476	234
Arkansas	350	111	372	32	2,141	145	2,286	383	1,815	207	2,022	266
California	459	426	445	220	2,451	166	2,617	1,997	2,146	174	2,320	1,319
Colorado	106	65	132	69	575	93	668	371	524	105	629	322
Connecticut	30	21	34	15	112	.....	112	149	143	3	146	100
Delaware	29	8	14	2	135	10	145	29	92	5	97	17
Florida	249	250	261	79	1,117	40	1,157	1,005	1,199	32	1,231	585
Georgia	336	88	304	52	2,377	25	2,402	495	1,731	30	1,761	257
Hawaii	6	8	9	5	33	.....	33	52	33	1	34	55
Idaho	92	18	125	13	569	83	652	104	515	61	576	76
Illinois	543	274	480	86	4.087	432	4,519	952	2,515	396	2,911	401
Indiana	416	86	320	31	2,566	261	2,827	518	1,497	244	1,741	250
Iowa	606	68	356	16	5,464	342	5,806	257	2,813	290	3,103	157
Kansas	399	32	451	30	2,137	307	2,444	185	1,623	377	2,000	188
Kentucky	461	120	502	72	2,778	55	2,833	453	2,212	41	2,253	250
Louisiana	268	108	321	56	1,424	97	1,521	498	1,427	146	1,573	310
Maine	23	13	26	4	116	1	117	78	108	2	110	52
Maryland	82	66	66	35	485	22	507	284	383	25	408	161
Massachusetts	16	40	18	27	85	.....	85	182	69	.....	69	128
Michigan	317	202	301	59	1,667	142	1,809	781	1,183	126	1,309	398
Minnesota	592	96	357	43	3,626	521	4,147	421	1,855	309	2,164	215
Mississippi	326	54	365	57	2,055	77	2,132	397	1,820	150	1,970	192
Missouri	544	105	399	40	3,177	146	3,323	520	2,003	134	2,137	305
Montana	123	16	140	22	506	260	766	111	576	150	726	114
Nebraska	344	32	297	20	2,758	179	2,937	139	1,737	208	1,945	91
Nevada	11	18	11	17	78	3	81	110	60	8	68	68
New Hampshire	18	14	26	10	67	.....	67	68	71	.....	71	40
New Jersey	37	95	26	46	196	3	199	386	157	1	158	238
New Mexico	40	29	44	24	264	16	280	157	235	13	248	113
New York	332	139	343	68	1,441	61	1,502	642	1,235	57	1,292	442
North Carolina	305	98	260	60	2,509	43	2,552	576	1,776	28	1,804	322
North Dakota	280	27	128	16	1,474	722	2,196	133	685	393	1,078	71
Ohio	476	289	363	89	2,689	207	2,896	989	1,915	192	2,107	434
Oklahoma	423	104	401	50	1,672	184	1,856	386	1,261	190	1,451	282
Oregon	120	57	198	23	632	31	663	308	665	40	705	194
Pennsylvania	280	152	292	88	1,358	22	1,380	806	1,151	35	1,186	520
Rhode Island	1	6	3	5	12	.....	12	27	9	.....	9	26
South Carolina	165	58	146	36	1,155	22	1,177	277	860	26	886	169
South Dakota	191	18	109	4	1,423	192	1,615	114	722	120	842	47
Tennessee	383	99	352	37	2,504	46	2,550	527	1,697	51	1,748	196
Texas	1,084	457	998	297	5,144	250	5,394	2,199	4,713	295	5,008	1,786
Utah	57	61	99	32	343	10	353	244	331	17	348	163
Vermont	63	20	52	3	202	4	206	42	148	.....	148	16
Virginia	259	64	272	31	1,436	6	1,442	420	1,194	18	1,212	289
Washington	187	102	212	24	873	106	979	494	913	85	998	228
West Virginia	79	23	88	15	320	.....	320	129	271	.....	271	106
Wisconsin	630	89	617	42	3,528	126	3,654	442	2,421	111	2,532	237
Wyoming	33	26	32	16	237	16	253	133	164	20	184	83
U.S. Government	24	14	19	27	49	.....	49	449	70	.....	70	383
Miscellaneous‡	10	230	12	3	42	3	45	784	190	.....	190	364
TOTAL	**12,499**	**4,736**	**11,481**	**2,220**	**74,142**	**5,549**	**79,691**	**21,928**	**54,664**	**5,029**	**59,693**	**13,482**

Data released August 25, 1980, Farm & Industrial Equipment Institute.

*Figures do not include garden tractors, motor tillers or contractors off-highway types. Report includes units marketed by these firms: Allied Farm Equip. (Leyland, Satoh); Allis-Chalmers; Belarus; J I Case; Deere; Deutz; Ford; International Harvester; Long; Massey-Ferguson; R. M. Wade (Satoh); Steiger; Versatile; and White.

†The monthly sales are those reported for that month only. The cumulative totals are subject to revisions reflecting updating in the basic sales data.

‡Sales reported as miscellaneous are retail sales which cannot be classified by state or as U.S. Government. They include sales and dispositions that do not go through usual marketing channels such as gifts to non-profit organizations, intra-plant or company transfers, etc.

AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

JONES FARM EQUIPMENT CO.
Dothan, Alabama
(August 12, 1980)

ALLIS-CHALMERS TRACTORS

7080 diesel, 1977 (Excellent)	20,500*
5040 diesel, 1976 (Good)	3200*
5040 diesel, 1976 (Good)	3400*
200 diesel, 1973 (Good)	4100*
190 diesel, 1968 (Excellent)	3750

CASE TRACTORS

430 diesel, 1962 (Fair)	860
380, (Good)	3800*

DAVID BROWN TRACTORS

995 diesel, 1975 (Excellent)	3450*
885 diesel, 1973 (Good)	2800*
880 diesel, 1966 (Good)	1550
880 diesel, 1966 (Good)	1750
770 diesel, 1966 (Good)	1000*

JOHN DEERE TRACTORS

4840 diesel, cab, duals, 1978 (Excellent)	29,100
3020 diesel, 1967 (Good)	4350
3020 diesel, 1965 (Good)	5200*
2630 diesel, 1975 (Excellent)	7300
2510 diesel, 1966 (Good)	3900*
2040 diesel, ldr., 1976 (Good)	6250*
2030 diesel, 1975 (Good)	4100
2020 diesel, 1969 (Good)	3200*
2010, 1964 (Fair)	1200*
1520 diesel, 1968 (Good)	4100*
1010, 1963 (Good)	1900*
1010 diesel, 1962 (Fair)	1100*
820 diesel, 1973 (Good)	2600
435 diesel, 1959 (Fair)	850
430, plow, 1958 (Good)	1425*
430, 1958 (Fair)	850
420, 1956 (Good)	1300
420, cutter, 1956 (Fair)	5875*
M, cult., plow, har., 1949 (Good)	5850*

FORD-FERGUSON TRACTORS

9N, 1947 (Good)	825
9N, 1946 (Good)	950
9N, 1944 (Rough)	450
9N, 1944 (Rough)	375

FORD TRACTORS

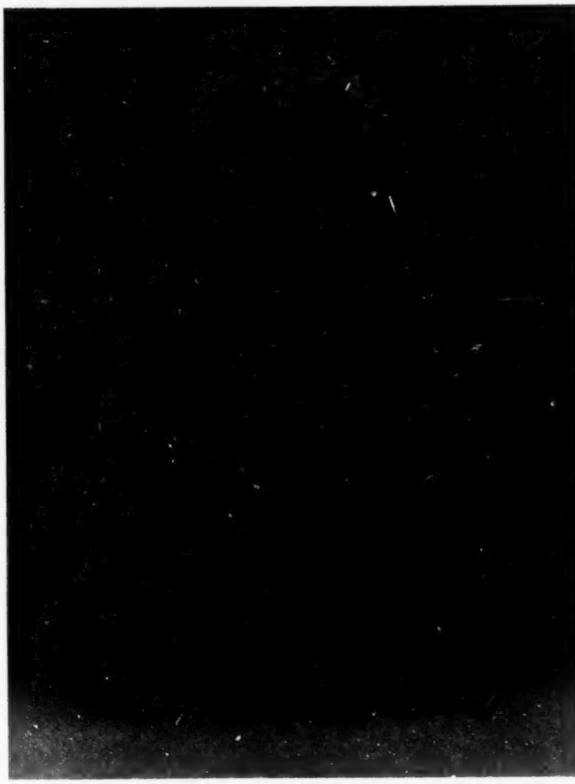
7500 diesel, ldr., backhoe, (Good)	6500*
7000 diesel, 1974 (Good)	5800
5000 diesel, 1970 (Excellent)	5500*
5000 diesel, 1970 (Fair)	3250*
5000 diesel, 1967 (Fair)	3350
5000 diesel, 1967 (Rough)	2450
5000 Select-O-Speed, 1966, (Rough)	2250*
4000 diesel, 1972 (Fair)	2550
4000 diesel, 1970 (Fair)	2600
4000 diesel, 1968 (Good)	3700*
4000 diesel, 1968 (Good)	3700
4000 diesel, 1968 (Good)	3750
4000 diesel, 1963 (Fair)	1400
4000, backhoe, 1963 (Fair)	2200*
4000, corn picker, 1963 (Fair)	1250
3550 diesel, ldr., 1968 (Good)	5500*
3000 diesel, 1966 (Good)	2700
3000, 1965 (Good)	2750
2000 diesel, 1969 (Excellent)	3800
2000, 1967 (Good)	2500
2000, 1963 (Rough)	875*
2000, 1963 (Fair)	1350
860, 1955 (Good)	1650
850, 1956 (Good)	1800
841 diesel, 1961 (Good)	1675
841 diesel, 1958 (Good)	1750
841 diesel, ldr., 1958 (Rough)	1275
841 diesel, 1958 (Fair)	1250*
650, 1955 (Fair)	1500*
641, 1960 (Good)	1800
641, 1959 (Fair)	1550
641, 1958 (Good)	1800
641, 1958 (Good)	2350
640, 1956 (Good)	1700*
Power Maj. diesel, 1959 (Good)	900
Dexta, 1959 (Good)	1200
Dexta, 1958 (Good)	1150
Dexta, 1958 (Good)	1250
Dexta, 1958 (Good)	1300*
NAA, 1954 (Fair)	1150
8N, 1951 (Fair)	725
8N, 1951 (Excellent)	1500
8N, 1951 (Good)	1200
8N, 1950 (Good)	1125
8N, 1949 (Good)	1050
8N, 1948 (Fair)	875*
8N, 1948 (Good)	1050
8N, 1948 (Good)	1050

HEFTY TRACTOR

Hefty G, (Good)	4450

INTERNATIONAL HARVESTER TRACTORS

2400 diesel, ldr., backhoe, 1972 (Good)	4450
1466 diesel, 1972 (Fair)	6300*



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7555 E. Hampden Ave., Suite 509,
Denver, CO 80231.

GRAMMER

Circle (12) on Reply Card

1066 diesel, 1973 (Good)	7350
706, 1965 (Rough)	2050
706, 1964 (Rough)	1000
664 diesel, 1972 (Fair)	3200*
656 diesel, 1970 (Fair)	2800*
656 diesel, 1971 (Fair)	2400*
656 diesel, 1965 (Good)	3400
574 diesel, 1972 (Fair)	3250*
574 diesel, 1972 (Fair)	3400*
574 diesel, 1972 (Fair)	3500*
544 diesel, 1973 (Rough)	2350
504 diesel, 1964 (Good)	2250
504 diesel, 1963 (Fair)	1450*
460 diesel, 1959 (Good)	1100*
454 diesel, 1971 (Good)	3050
444 diesel, 1970 (Rough)	1150
444 diesel, 1970 (Rough)	1250
424 diesel, mo., 1965 (Good)	1750
B414 diesel, 1962 (Good)	1100
340, 1961 (Fair)	1400
B275 diesel, 1959 (Rough)	650
240, cotton picker, 1961 (Fair)	1300*
Sup. H, 1953 (Good)	500
C, 1948 (Good)	550
A, mo., 1946 (Good)	650
185, Cub Loboy, mo., 1975 (Excellent)	1700
154, Cub Loboy, mo., 1970 (Excellent)	1800
Cub, cult., plow, har, 1948 (Good)	1200

KUBOTA TRACTOR

B6000, (Good)	2500

LONG TRACTORS

460 diesel, 1976 (Good)	3200*
445 diesel, 1976 (Fair)	1500*
360 diesel, 1976 (Good)	3200*
360 diesel, 1976 (Good)	2800*

MASSEY-FERGUSON TRACTORS

1130 diesel, bld., 1969 (Rough)	2300
1130 diesel, 1968 (Fair)	3000*
1100 diesel, 1970 (Good)	4000
1085 diesel, 1973 (Good)	5800*
275 diesel, 1975 (Good)	6200
275 diesel, 1975 (Good)	6400*
265 diesel, 1975 (Good)	5700*
235 diesel, 1976 (Good)	4350
180 diesel, 1967 (Fair)	3100
180 diesel, 1967 (Good)	3700*
180 diesel, 1966 (Good)	3900
175 diesel, 1974 (Good)	3800
175 diesel, 1973 (Good)	3800
175 diesel, 1973 (Fair)	3400
175 diesel, 1970 (Good)	3700
175 diesel, 1970 (Fair)	3400
175 diesel, 1969 (Good)	3400
175 diesel, 1968 (Good)	3700*
175 diesel, 1966 (Rough)	1900
165 diesel, 1972 (Good)	3800
165 diesel, 1968 (Fair)	2850
165 diesel, 1967 (Good)	3300*
165 diesel, 1967 (Good)	3350
165 diesel, 1967 (Good)	3250
165 diesel, 1967 (Fair)	2750
165 diesel, 1966 (Fair)	2800
165 diesel, 1966 (Rough)	2100
165 diesel, 1966 (Good)	3300*
165 diesel, 1966 (Good)	3300
165 diesel, 1966 (Excellent)	3800
165 diesel, 1966 (Excellent)	3750
150 diesel, 1965 (Good)	2900*
135, 1974 (Excellent)	3750
135 diesel, 1973 (Fair)	2600
135 diesel, 1973 (Good)	3100
135, 1967 (Fair)	2400
135 diesel, 1967 (Excellent)	3500*
135 diesel, 1967 (Good)	3300
135 diesel, 1967 (Good)	3450*
135 diesel, 1966 (Good)	3350
135, 1966 (Good)	3400*
135 diesel, 1966 (Good)	3000
65 diesel, 1963 (Good)	1700
65 diesel, 1963 (Rough)	1055
65 diesel, 1963 (Good)	1750
65 diesel, 1961 (Good)	1950
65 diesel, 1961 (Rough)	1000
50 diesel, 1962 (Good)	1600
40 diesel, 1957 (Good)	1500
35, 1963 (Rough)	1350*
35, 1962 (Good)	2125
35 diesel, 1961 (Good)	2050
35, 1956 (Fair)	1350*
35, 1956 (Fair)	1175
35, 1956 (Fair)	1300
35, 1955 (Fair)	1350
25 diesel, 1964 (Rough)	650
TO30, 1953 (Good)	1200
TO30, 1953 (Good)	1000
TO20, 1950 (Good)	950
TO20, 1949 (Fair)	750*

OLIVER TRACTORS

2655 diesel, 4WD, 1972 (Good)	4700
2-105 diesel, cab, duals, 1976 (Excellent)	12,200
1250 diesel, 1967 (Good)	1700
2-85 diesel, 1977 (Excellent)	10,000

SATOH TRACTOR

650, (Good)	1050

VERSATILE TRACTOR

145 diesel, 1969 (Fair)	4250*

NOTES

Prices reported are for individual sales at wholesale on "as is," "cash and carry" basis.

Prices reported are NOT averages.

Condition classifications: EXCELLENT means—Engine: in perfect condition, 400 to 600 hours of use; Rubber: 80% tread remaining, no breaks or cracks; Paint: original and bright; General Appearance: excellent.

GOOD means—Engine: good running condition; Rubber: 70% tread remaining, no breaks or cracks; Paint: original paint or a good repaint job; General Appearance: good over-all.

FAIR means—Engine: possibly in need of a minor overhaul to restore; Rubber: 60% tread remaining, some cracking evident in side walls; Paint: only fair, weathered and some rust apparent; General Appearance: worn, some dents, minor parts such as gage covers missing or broken.

ROUGH means—Engine: obviously in need of a major overhaul; Rubber: smooth; Paint: scarred, weathered, rusty, needs painting urgently; General Appearance: dents, ruptures, broken parts, loose wires, some components such as lights broken, missing or inoperative.

DEMONSTRATOR means—used for demonstrating only and in practically new condition.

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- Boost sales, profits & customer satisfaction – a real problem solver.
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October 7, 1980
TWO DOLLARS

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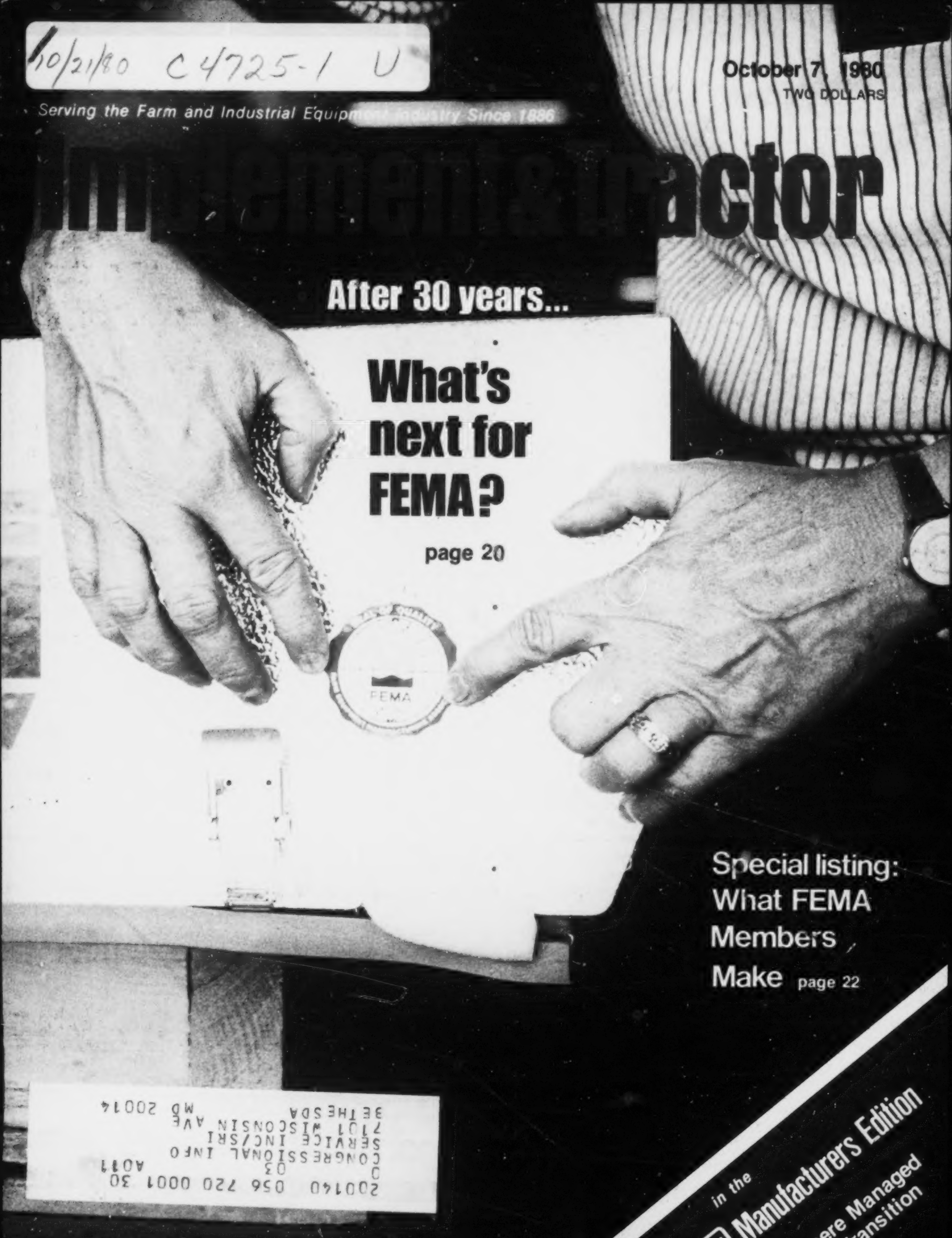

After 30 years...

What's next for FEMA?

page 20

Special listing: What FEMA Members Make page 22

in the
Manufacturers Edition
ere Managed
ransition

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BETHESDA MD 20014

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Implement & Tractor

The Business Magazine of the Farm and Industrial Equipment Industry

in this issue...

8: **Hesston Makes Its Bid for a Place in the Farm Tractor Marketplace.** Twenty-nine Fiat-built tractors are introduced to dealers for the North American market. Can Hesston take market shares away from the big seven U.S. companies?

16: **FEWA, FEMA and AIMRA Head for New Orleans.** I&T previews the programs and events for the annual meetings of the Farm Equipment Wholesalers Assn., Farm Equipment Manufacturers Assn., and the Agricultural & Industrial Manufacturers Representatives Assn. to be held concurrently in New Orleans in November.

20: **After 30 Years...What Next for FEMA?** The shortliner organization aims at providing broader services through the 'eighties.

22: **FEMA Members and Products.** I&T presents a listing of the more than 440 FEMA members and the products they manufacture.

On the Cover...A worker at Great Plains Industries, Inc., Wichita, Kan., puts a Seal of Quality decal on one of the company's coolers. The Seal of Quality is a program instituted by the Farm Equipment Manufacturers Assn., which is the focus of this issue.

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what's ahead...

I&T
SINCE 1886

October 7, 1980

RETAIL SALES WERE OFF IN AUGUST, WITH ONE EXCEPTION, according to the flash report of the Farm & Industrial Equipment Institute. While all tractors showed a decline for the month of 5.8 per cent, sales of two-wheel-drive units over 100 horsepower were up 4.7 per cent. The full flash report:

Unit Retail Sales

	August			January-August		
Equipment	1980	1979	Pct. Change	1980	1979	Pct. Change
Farm Wheel Tractors						
2-wheel drive						
40-100 hp	3,454	3,966	-13.0	40,357	45,994	-12.3
Over 100 hp	3,495	3,336	+ 4.7	30,783	43,021	-28.5
Total 2-wheel drive	6,949	7,302	- 4.9	71,140	89,015	-20.1
4-wheel drive	612	720	-15.0	6,244	7,165	-12.9
Total	7,561	8,022	- 5.8	77,384	96,180	-19.6
Combines (S-P)	2,101	3,148	-33.3	11,597	14,363	-19.3
Balers*	1,748	2,371	-26.3	10,704	14,585	-26.7
Forage Harvesters**	967	1,121	-13.8	4,735	5,501	-14.0
Mower-Conditioners	2,000	2,745	-27.2	14,694	20,127	-27.0

*Bales under 200 lbs. **Shear-bar type.

INDEPENDENT OUTDOOR POWER EQUIPMENT RETAILERS, according to a survey conducted by I&T's sister publication, Lawn & Garden Marketing, are expressing grave concern about the decisions of several major lawn-garden equipment makers to sell their products through "mass-merchandising" outlets and also about a general deterioration in product quality. Many of the independent dealers are said to be interested in handling overseas-produced lines, according to LGM. The survey's findings are covered in part in the magazine's October issue.

UPCOMING DATA FROM 1978 CENSUS OF AGRICULTURE may contain some surprises. Preliminary results of the 1978 enumeration, say census officials, should be compared with the 1974 census with caution "because of significant improvements in data collection procedures." Take Missouri, for example: The 1974 census counted 115,711 farms on 29.8 million acres; the 1978 census showed increases: 121,826 farms, 30.77 million acres. Tractors on all Missouri farms in 1974 were counted at 185,123; in 1978, the number was up to 205,224. Tractors on Missouri farms with sales of $2,500 or more jumped from 151,015 to 182,553. The differences in total tractor numbers tend to reflect the changes in collection procedures; the difference between tractors on all farms and on those with sales over $2,500 reflects the presence on many acreages, held by "sundown farmers" and others, of small, chore-type tractors--either Japanese imports of recent vintage or much older used units made in America.

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I&T
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AUCTION PRICES OF USED EQUIPMENT

An exclusive I&T monthly report of actual prices paid recently at these leading national wholesale auctions.

Asterisk beside tractor price indicates highest bid offered on tractors which were not sold.

BILL ENLOW TRACTOR SALES
Sapulpa, Okla.
(August 9, 1980)

ALLIS-CHALMERS TRACTORS

WD, 1949 (Fair)	400*
WD45 diesel, 1956 (Good)	1125
D14 LP, 1959 (Good)	1450
D14, 1959 (Good)	1200
D17 LP, 1961 (Rough)	1200*

CASE TRACTORS

D, 1953 (Fair)	320
VAC, 1954 (Fair)	400*
DC4, 1953 (Fair)	475*
430 diesel, 1963 (Good)	1600*
500, 1955 (Good)	1650
930 diesel, 1964 (Good)	2600
1030 diesel, 1966 (Good)	2500
1030 diesel, 1967 (Fair)	2100*
450 diesel dozer, 1968 (Good)	4450*

DAVID BROWN TRACTOR

990 diesel, 1963 (Fair)	1450

FERGUSON TRACTORS

20, 1948 (Fair)	925
20, 1948 (Fair)	950
20, 1949 (Good)	1180
20, 1949 (Good)	1275
20, 1949 (Good)	1070
20, 1949 (Rough)	675
20, 1950 (Rough)	600
20, 1951 (Good)	1050
20, 1951 (Good)	1000*
30, 1953 (Good)	1275

FORD-FERGUSON TRACTORS

9N, 1942 (Fair)	800*
9N, 1943 (Good)	950
9N, 1943 (Good)	910
9N, 1944 (Good)	975
9N, 1944 (Good)	900
9N, 1945 (Good)	1075
9N, 1945 (Good)	1300
9N, ldr., 1945 (Good)	1000*
9N, 1945 (Good)	890*
9N, 1946 (Good)	1175

FORD TRACTORS

8N, 1947 (Fair)	900*
8N, 1947 (Fair)	850*
8N, 1947	1075*
8N, 1948	1250
8N, 1948	1050
8N, 1948	1100
8N, 1948	1050*
8N, 1948	1125
8N, 1949	1150
8N, 1949	925
8N, 1949	1050
8N, 1949	1175*
8N, 1949	1075
8N, 1950	915
8N, 1950	1000
8N, 1950	1125
8N, 1950	1175
8N, 1951	1175*
8N, 1951	1225*
8N, 1951	1350
8N, 1951	1300
8N, 1952	1250
8N, 1952	1225
8N, 1952	1350*
8N, 1952	1300
8N, 1952	1275
8N, backhoe, 1952 (Good)	1700*
8N, 1952 (Good)	1400
8N, 1952 (Good)	1400
NAA, 1953 (Good)	1750
NAA, 1953 (Good)	1700*
NAA, 1953 (Good)	1750
NAA, 1953 (Fair)	1500
NAA, 1953 (Fair)	1200
NAA, 1953 (Good)	1750
NAA, 1953 (Rough)	1075
NAA, 1953 (Fair)	1500
NAA, 1954 (Good)	1775
NAA, 1954 (Good)	1900*
NAA, 1954 (Good)	1650
600, 1955 (Fair)	1100*
600, 1955 (Good)	1800*
640, 1955 (Rough)	910
640, 1956 (Fair)	1550*
640, 1956 (Fair)	1400*
640, 1956 (Good)	1850*
640, 1956 (Good)	1900
641, 1957 (Good)	1800*
641, 1958 (Good)	1875
800, 1954 (Fair)	1475
800, 1955 (Good)	1925
860, 1955 (Good)	1960
801, 1957 (Good)	1775
801, 1958 (Good)	1875
861, 1958 (Fair)	1675
871, Select-O-Speed, 1956 (Fair)	1000*
Dexta diesel, 1960 (Fair)	1200*
2000, 1962 (Good)	2100
2000, 1962 (Fair)	1650*
2000, 1963 (Good)	2200*
3000, 1965 (Fair)	2300
3000, 1967 (Good)	2750*
3000 diesel, 1968 (Good)	2850
3000 diesel, 1969 (Good)	3250
4000, ldr., 1966 (Good)	3700
5000 diesel, Select-O-Speed, 1970 (Good)	2850*
5000 diesel, ldr., 1967 (Fair)	5450
4400, 1972 (Good)	3300

INTERNATIONAL HARVESTER TRACTORS

A, 1945 (Fair)	325
Cub, 1958 (Good)	1400*
154, 1969 (Fair)	1500
154, 1970 (Good)	1800
300, 1954 (Fair)	710
656 diesel, 1969 (Good)	4700
1566 diesel, cab, 1974 (Good)	11,500*

JOHN DEERE TRACTORS

420 diesel, 1956 (Good)	1825
2510 diesel, 1968 (Good)	4850
3020 LP, 1971 (Good)	3700*
4010 LP, 1963 (Good)	4850
300, 1972 (Fair)	2300*

KUBOTA TRACTOR

210 diesel, 1972 (Good)	1600

LEYLAND TRACTOR

384 diesel, 1962 (Good)	2000*

MASSEY-HARRIS TRACTOR

Pony, 1950 (Good)	450*

MASSEY-FERGUSON TRACTORS

35, 1958 (Rough)	1000
35, 1959 (Fair)	1500*
35, 1959 (Fair)	1600
35, 1960 (Good)	1800*
35 diesel, 1961 (Good)	1850*
35 diesel, 1962 (Good)	2100
35 diesel, 1963 (Good)	2650
50, 1960 (Fair)	1500
65, 1958 (Good)	1700*
65 diesel, ldr., 1960 (Good)	2250*
65, 1961 (Good)	1975
65 diesel, 1962 (Good)	2100*
65, 1962 (Fair)	1500*
65 diesel, ldr., 1963 (Good)	2650
S-90 diesel, 1964 (Fair)	1650*
20, 1971 (Good)	3100*
20, 1971 (Good)	3050*
135, 1968 (Good)	2500
135, 1969 (Good)	2905*
135 diesel, 1970 (Good)	3180*
150, 1968 (Good)	2600
165 diesel, 1966 (Fair)	2850
165 diesel, 1967 (Good)	3200*
165 diesel, 1970 (Good)	3550
165 diesel, 1972 (Good)	3650
175 diesel, 1969 (Good)	3180*
175 diesel, 1970 (Good)	3500
180 diesel, 1966 (Good)	3300
180 diesel, 1968 (Good)	3275
180 diesel, 1971 (Good)	3350*
1080 diesel, 1970 (Good)	4800
1080 diesel, 1972 (Good)	5800
230 diesel, (New)	6400*
230 diesel, (New)	6350*
230 diesel, (New)	6450*
230 diesel, (New)	6500*
230 diesel, (New)	6450
245 diesel, (New)	7100
275 diesel (New)	12,000*
275 diesel (New)	12,450
285 diesel, (New)	13,200*

MINNEAPOLIS-MOLINE TRACTORS

M-670 diesel, 1968 (Good)	2400*
G1000, 1967 (Good)	3625*

OLIVER TRACTORS

55 diesel, 1957 (Good)	1500*
550, 1960 (Fair)	850

SATOH TRACTORS

Beaver diesel, 1971 (Good)	2000*
650G, mo., 1972 (Good)	1900

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